REPORT OF TASK FORCE CONCERNING THE BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY

October 1987

Prepared by

Western Management Consultants

for the

Minister of Advanced Education and Job Training

Province of British Columbia

REPORT OF TASK FORCE CONCERNING THE BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY

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October 19, 1987

The Honorable Stanley Hagen
Minister of Advanced Education
and Job Training
Province of British Columbia
Parliament Buildings
Victoria, B.C.
V8V 1X4

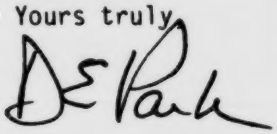
Dear Mr. Hagen:

As requested, over the past sixty days I have acted as a one person task force to assist in charting the future direction for the British Columbia Institute of Technology. This report presents the results of the work which I have undertaken in conjunction with a three person secretariat whose names are identified in the report.

We have had excellent cooperation in this work from a wide variety of sources. We have met with many knowledgeable and concerned individuals and groups in British Columbia and elsewhere. We have also had the benefit of substantial amounts of documentation bearing on the subject of this review, including resource material bearing generally on the subject and many written submissions prepared specifically for presentation to this task force. We are grateful for the cooperation and assistance which has been afforded us.

I appreciate having had this opportunity to be of service to you.

Yours truly,



David E. Park
Fellow, The Institute of
Management Consultants of
British Columbia

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Attach.

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SUMMARY

INTRODUCTION

1. The mandate of this task force was to review B.C.I.T. and its programs in the light of the desire which the provincial government has expressed for a world class institution of technology education.

2. In carrying out its work the task force has consulted extensively with groups and individuals from B.C.I.T., many others in British Columbia knowledgeable concerning the subject, and knowledgeable authorities from other jurisdictions. We also have had large numbers of written submissions and have consulted extensive relevant documentation.

PROGRAM ANALYSIS

3. A list of some 66 programs or subprograms has been identified which might be transferred or eliminated from B.C.I.T. Most are trades training involving costly physical facilities. Nearly all must continue to operate, and would have to be funded elsewhere.

POTENTIAL ORGANIZATIONAL SOLUTION

4. For cost and other reasons the physical relocation of this trades training is not desirable. However, potential exists for an organization solution, possibly involving the creation of a Lower Mainland Trades Training Authority. Alternately B.C.I.T. should be reorganized to give more appropriate recognition to trades training.

5. Neither of these solutions would result in the achievement of the vision which is described in the preamble to the terms of reference for this task force, i.e. a world class institution of technology education.

TECHNOLOGY TRAINING AT B.C.I.T.

6. The "old" part of B.C.I.T. is in essence an institute of the polytechnic type offering two year diploma programs and some one year post-diploma programs. The essence of the polytechnic type of institutions is a strong orientation toward the application of the subject material taught, with close links to business and industry. The objective is to produce graduates who are immediately useful and well targeted to business and industry in the area of the institution.

   To date B.C.I.T. has produced close to 27,000 technology graduates in business, health science, and engineering technologies. B.C.I.T. is the predominant institution in B.C. in terms of the numbers of graduates in these areas.

7. B.C.I.T. entrance is heavily sought after by students; students entering B.C.I.T. are relatively mature (average age 23 years). Most last attended a university or community college.

8. B.C.I.T. technology graduates are important to and very positively regarded by British Columbia employers. A large majority of these graduates find employment quickly, at salaries that are not a great deal less than those offered university graduates. It is our distinct impression that any prospect of a serious disruption to the supply of graduates from B.C.I.T. would be viewed very negatively by a large segment of business and industry in the Lower Mainland.

B.C.I.T. AND THE COMMUNITY COLLEGES

9. Over the years community colleges have come to offer some of the programs offered at B.C.I.T. For several reasons a generally antagonistic relationship developed between these colleges and the Institute.

10. The preamble to the terms of reference for this task force state that "Despite the unquestioned progress that has been made since the merger of the B.C. Institute of Technology and the Pacific Vocational Institute, the Institute of Technology remains essentially indistinguishable from the Community College sector." However, in our relatively wide-ranging information gathering we came across only two groups who expressed this point of view. These were representatives of the community colleges, and some representatives of the Ministry. The balance of those with whom we consulted, including technical institutes in other provinces, representatives of business and industry who hire B.C.I.T. graduates, other knowledgeable observers, and of course the B.C.I.T. community, all see the Institute as distinctly different from the community colleges.

11. An analysis of program offerings and enrollment at B.C.I.T. in comparison with the community colleges indicates a clear difference. B.C.I.T. has the only large apprenticeship program, has no university transfer programs, and a minimal amount of adult basic program enrollment. Within the vocational area, the distribution of B.C.I.T. program enrollment is quite different from that of the community colleges. B.C.I.T. business school enrollment is proportionately much larger than is the case for business program enrollment at the community colleges. There generally is substantially greater enrollment proportionately in specialized health sciences programs at B.C.I.T. than in the colleges, and the same holds true for engineering technologies. B.C.I.T. has far more programs accredited by the Applied Science Technologists & Technicians of British Columbia and also has numerous unique programs.

12. What appears to have happened is that B.C.I.T. has continued to fulfill its role or mandate as originally intended. In the interim, community colleges have begun to offer some programs in business, health sciences and engineering technology, i.e. in areas where B.C.I.T. always has offered programs. Thus some overlap or duplication has grown up.

DESIRABLE DUPLICATION BETWEEN B.C.I.T. AND THE COLLEGES

13. Some degree of overlap or duplication between B.C.I.T. and the community colleges is positive and desirable. The major role played by B.C.I.T. in serving the province and the Lower Mainland in particular should not preclude the offering of technology programs where warranted elsewhere in the province.

14. The incorporation of advances in applied technology into the relevant curriculums of all colleges and institutes should not be unduly inhibited. A primary factor to be considered is ease of access by the student population of the province. Specialized courses dealing with unique aspects of high technology might be restricted to a specific location. However, all regions of British Columbia should have reasonable access to instruction involving advanced technology, at least to the level which can be justified in terms of population, numbers of students, the requirements of business and industry in the region, delivery costs, and the equitable distribution of scarce financial resources.

FRICTION BETWEEN B.C.I.T. AND THE COLLEGES

15. For many years there has been friction between B.C.I.T. and the community colleges generally. B.C.I.T. has been perceived to be arrogant and uncooperative by much of the remainder of the college system. Current management at B.C.I.T. has been working to improve the situation. However, this difficult legacy will take some time to overcome.

16. B.C.I.T. also is seen as having sought special status, and as having used privileged channels to achieve that. The Institute is seen as seeking and receiving special financial treatment not accorded to other institutions in the college/institute system. This is doubly aggravating in that B.C.I.T. is seen as an aging institution with aging programs, which increasingly are being equaled or surpassed in quality by some of the community colleges.

CENTRE FOR APPLIED TECHNOLOGY

17. There is a strong need for B.C.I.T. to continue to supply relatively large numbers of two year technology diploma and post diploma program

graduates to fill the needs of business and industry. However, while achieving that the Institute can play an increasing role in applied research and in the transfer of relevant technology to business, industry and the workforce in British Columbia.

The faculty and management of B.C.I.T. have proposed an innovative approach to regularizing and fostering this applied research and technology transfer activity. They propose that a Centre for Applied Technology be established at B.C.I.T. "---which would develop expertise in specific technologies and facilitate technology transfer to business/industry."

The proposed Centre for Applied Technology would have several facets, including a Core Technology Centre; Development Assistance Centre; Industry Liaison; International Liaision and Centre for Curriculum Design and Development.

18. We regard the proposal for a Centre for Applied Technology as a very worthwhile model. However, we are concerned as to whether B.C.I.T. is the appropriate vehicle for this ambitious project. In our view this development and the desire of the provincial government for a "---world class leader in technology---" and "---an international beacon of excellence in technology training and education" brings to mind images of the Massachusetts Institute of Technology and the California Institute of Technology. The present B.C.I.T. is a very long way from these institutions in terms of level of students, programs, faculty, and function.

19. B.C.I.T. is fulfilling its mandate as an institution of the polytechnic type offering two year and post diploma programs in business, health sciences, and engineering technologies. The fairly large numbers of graduates it produces appear to suit the needs of business and industry, and are well received. We repeat that it would be a retrograde step to interfere significantly with this flow, and that such a move likely would generate very strong resistance among British Columbia business and industry.

20. In our view, the remaking of B.C.I.T. into the desired vision would also be a very difficult undertaking, requiring sweeping changes of faculty and management. Impediments involve the inertia of the institution, including its collective agreements with faculty and staff, its physical plant, and the need for ongoing close relationships with trades training.

21. We believe that a fresh start would provide a better opportunity for success, probably would involve fewer risks of all types, and could cost less.

CONCEPT OF A COLLEGE OF ADVANCED TECHNOLOGY

22. Given the vision expressed in the preamble to the terms of reference for this task force, and in the light of our perception of the current realities of the post-secondary system of education in British Columbia, we are moved to suggest a concept for an institution that might have a reasonable expectation of fulfilling that vision.

23. We suggest that consideration be given to establishing a British Columbia College or Institute of Advanced Technology. Our vision is that such an institution would be relatively small, and elite. It would accept as undergraduate input only the brightest graduates of the two year diploma programs at the existing colleges and institutes of British Columbia, together with some reasonable proportion of comparable university students having achieved an equivalent standing. Some quota of outstanding diploma graduates or university transfer students from other provinces or other countries also would be accepted.

24. The faculty would be carefully chosen from British Columbia and elsewhere, on the basis of their ability to perform in advanced applied technological research, on their abilities to transfer this to business and industry, and upon their ability to inspire excellence in a real world sense in the performance of superior students.

25. Some reasonably limited scope of disciplines would be required in this institution to guard against degrading performance through dilution of effort and lack of concentration of resources. These disciplines should be based in part upon the existing and potential economy of British Columbia, including its burgeoning high technology components.

26. Entrepreneurship and the commercial harnessing of technology would receive emphasis in the curriculum of such an institution rather than technological and scientific subjects alone. These qualities would be vital in graduates of the institution.

27. Clearly such an institution would be degree granting to at least the baccalaureate level. To achieve the "beacon of excellence" which is desired, postgraduate study would be desirable.

28. This would not be another university, but an institution in the polytechnic model. The relevance of its work and its graduates to business and industry would be a test of its success.

29. This institution would not be another Ryerson, nor an extension of B.C.I.T. This institution would be elitist without apology. Its role would be an elite role, in contrast to the highly successful popularist and community role of the existing college system in British Columbia. Generally it would complement rather than compete with the existing post-secondary system of education in British Columbia. It should probably be physically separate from any existing institution, and free of the impediments which are present in existing institutions.

30. It is this institution that we believe would be fitting for the Centre for Applied Technology which B.C.I.T. has described. A similar, smaller centre would still be a worthwhile adjunct to B.C.I.T., though one involving expenditures substantially less than the $12 million annual operating and capital costs which B.C.I.T. has estimated. B.C.I.T. has significant additional potential to assist business and industry through technology transfer, but generally not at the level we believe is reflected in the preamble to the terms of reference for this task force.

31. The proposed College of Advanced Technology would offer a solution to the transfer problem which currently faces the outstanding community college and institute graduates in British Columbia in most disciplines. Rather than having to travel to other jurisdictions and having to enter the university stream, they would be better served here in British Columbia. They would be encouraged to retain their practical or applied orientation rather than to become the more theoretically oriented or "well-rounded" university graduates.

32. Another feature of the small size of the institution should be closer contact between faculty and students. We believe that it should also be possible to minimize the management structure and the attendant costs, even though proportionately these might be high given the diseconomies of the smaller scale. Hopefully the relatively small scale of the institution would also be reflected in smaller budget requirements. Obviously there would be significant initial capital requirements.

33. A function which this College of Advanced Technology could fulfill once it has been properly established is to deal with the continuing education requirements of two year technology diploma graduates who are employed but wish to upgrade their qualifications through continuing education. In this way, another of the significant deficiencies of the current situation in British Columbia would be addressed.

GRANTING OF DEGREES

34. Some parts of B.C.I.T. have the potential to establish degree programs. However, we believe that the establishment of degree

programs at B.C.I.T. would threaten the fundamental purpose of the institution, which is to produce graduates of two year diploma and post-diploma programs.

35. In our visit to Ryerson Polytechnical Institute, we were impressed with the advice of the President, Dr. Brian Segal. Dr. Segal is a respected figure in post-secondary education in Canada, and one who has a penetrating knowledge of the past transition of Ryerson from a diploma granting to a degree granting institution. Dr. Segal persuasively argued that where a degree-granting institution begins to grant degrees, the diploma programs will tend to wither and disappear. That is what happened at Ryerson.

36. It was suggested to us by the senior executive officer of another technical institute outside of British Columbia, that institutional ambition may be a continuing threat to the relevance of an institution of technical education. In this statement he was referring to the tendency of these institutions to look towards degree granting status. We concur with the point of view which he expressed.

INSTITUTE COSTS

37. In terms of direct instructional costs, B.C.I.T. generally has a lower cost per student contact hour than the average for the college system. On the other hand, B.C.I.T., like other institutes of technology, has higher support or administrative costs relative to program costs than is the case for colleges. There are, however, a number of opportunities to reduce the administrative costs of B.C.I.T.

FUNDING

38. Given the realities of government funding shortages, B.C.I.T. should continue to aggressively pursue alternative funding sources and donations of equipment.

FACULTY RENEWAL

39. One of the problems facing B.C.I.T. is that a significant proportion of the faculty is aging. A significant proportion of those who are aging may not be keeping abreast of advancing technology, and may not be applying the level of energy and enthusiasm to their work that is desirable.

    B.C.I.T. is not alone in this problem; we understand that Ryerson and other institutions may face the same difficulty. This has come about in part due to the fact that instructors hired for this type of institution should have had substantial experience in business or industry before joining the faculty. The growing age of the Institute also is a contributing factor. Finally, the demographics of the population at large contribute to the situation.

40. We are aware that the current management of B.C.I.T. recently has taken significant steps to rectify this problem. The effects of these measures remain to be seen.

41. The Centre for Advanced Technology concept proposed by B.C.I.T., even if scaled down in size, likely would have a positive effect upon staff efforts to keep abreast of and to exploit technological advances. The competition involved, the rewards and recognition flowing from participation in the Centre, and the overall impact on faculty morale and value sets could have quite positive effects.

42. Another aspect of faculty renewal is the need for a continual inflow of new faculty. As the faculty ages, this should be matched by an inflow of younger, well qualified new faculty members who bring current knowledge of advancing technology and its application in business and industry.

    Coupled with this inflow should be an early retirement program to permit older faculty members to step aside. This would have to be carefully structured so that the better qualified and more capable, energetic older faculty members could be encouraged to remain.

FACULTY TRAINING IN INSTRUCTION

43. It is our understanding that new instructors taking up positions at B.C.I.T. do so without necessarily having had any training in the art of instruction. Particularly given the industrial rather than the academic background of technology instructors, some pedagogical training should be mandatory. In addition, progress towards a formal instructor's qualification should be required after faculty are hired.

PROGRAM RENEWAL

44. Some of the programs at B.C.I.T. may be aging, and the revision of their content may not have kept pace with advancing technology. There should be a more effective mechanism for ongoing program review to help ensure that programs are regularly updated.

45. There have been significant numbers of new programs added to those which B.C.I.T. offers. The Institute has introduced a significant number of programs relevant to changing technology and changing needs of business, industry, and other employees of B.C.I.T. graduates.

46. A concern which has been expressed to us is that funding provided to B.C.I.T. (and perhaps other educational institutions) in response to requests to fund specific programs is not always directed to these. There should be an accountability mechanism to provide the funding

source with information as to the disposition of the funds and the results achieved. Given the scarcity of public funds available for education, it is difficult to see why this type of reporting should not be more widely applied to post secondary education. The competition for funds is intense, and the availability of good information to facilitate rational funding decisions appears as a strong need.

ADVISORY COMMITTEES

47. Advisory committees can play a key role in monitoring and stimulating the ongoing relevance of programs. However, at least some of the B.C.I.T. advisory committees do not function as effectively as they should. There should be a regular, comprehensive follow up to the work of advisory committees.

CONCLUSION

48. In the limited time available, we have tried to the best of our ability to respond to the terms of reference given this task force. We have endeavoured to sift the voluminous inputs we have received to find solutions which would best serve all of those who have a stake in B.C.I.T., while offering a means to achieve the provincial government's vision of a world class institution of technological education in British Columbia. We hope that the information, analysis, and recommendations put forward for consideration will materially assist in resolving this situation.

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REPORT OF TASK FORCE CONCERNING
THE BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY

1. INTRODUCTION

In mid-August, 1987, a task force was struck to assist in charting the future course for the British Columbia Institute of Technology. The one person task force appointed was Mr. David Park of Western Management Consultants of Vancouver. To assist Mr. Park in this task, a three person secretariat was assigned. This secretariat comprised Mr. Greg Koyl of the staff of the Office of the Premier, Mr. Robert Elton, C.A., a nominee of the Ministry of Advanced Education and a Partner of the Vancouver office of Price Waterhouse, and Mr. Drug Svetic, the Vice-President of Education at B.C.I.T.

The announcement of this task force, background information and specific terms of reference are attached as Appendix A to this report. The purpose of the task force was to help direct the Institute into the future of high technology job training, given that the ability of British Columbia to adapt to new technology will be a significant factor in the future economic well-being of the province.

This background material notes that unquestionably progress has been made since the merger of the B.C. Institute of Technology and the Pacific Vocational Institute some 1 1/2 years ago. However, it expresses concern that B.C.I.T. is indistinguishable from the community colleges, and that it does not have a unique role in the post secondary educational system. The background material goes on to note that the goal of the merger was to create an institution that would assume a fundamental role in the province's economic strategy, which would provide educational leadership and which would "---stand as an international beacon for excellence in technology training and education." It is suggested that "---to give it a unique role, the Institute should probably reduce the general nature of its program profile and concentrate its efforts instead on

programs that will lead it to its recognition as a world class leader in technology. By careful program deletion, the required resources could be available to effect desired changes." Thus the task force has been appointed to carry out a program audit "---to identify those B.C.I.T. programs that could be offered within colleges so that the efforts of the Institute could be more clearly directed toward programs of a high tech nature."

The specific terms of reference were:

1. To assess the relevance of every program or program grouping offered within the current program profile.

2. To indicate possible deletions from the profile or enrolment reductions that would change the current focus of B.C.I.T. to one more in line with an expanded vision of the economic future of the province.

3. To attempt to define for the Institute a place within the educational spectrum that would clearly differentiate its role from that of colleges and universities.

4. To assess and recommend on the desirability of giving B.C.I.T. degree granting status.

Further instruction given orally to the task force suggested that where there was any question of whether its mandate should be interpreted more broadly or more narrowly, it was to be assumed that the former would apply.

2. APPROACH TO THE REVIEW

In undertaking this work we have consulted with many different individuals and groups in British Columbia and elsewhere. These have included several hundred individuals from B.C.I.T. itself in dozens of meetings occupying the equivalent of two to three calendar weeks. We understand that all groups at this institution who could be vitally affected were given the opportunity to address the task force and secretariat. These included numerous groups of faculty and staff, the management of the several schools within the Institute, general management, unions, students, alumni, the Board of Directors, and others.

We have also met with the Chairmen of all the Program Advisory Committees, and with representatives of business, industry and labour groups having a vital interest in the institution. Consultations were held with the Principals and other representatives of a large majority of the community colleges in the province, with the President of the University of British Columbia, and with the President, Vice-Presidents and others of Simon Fraser University. Meetings were held with a substantial number of managerial personnel in the Ministry of Advanced Education and Job Training. Others having a particular interest or particularly useful knowledge concerning B.C.I.T. were interviewed.

Meetings were held with the Presidents, certain Vice-Presidents and other management of the Northern Alberta Institute of Technology, Southern Alberta Institute of Technology, and Ryerson Polytechnical Institute. Other knowledgeable authorities were interviewed, including several in Ontario, and the Director (Principal) of Hong Kong Polytechnic who fortuitously visited Vancouver during this period. A list of those consulted is attached as Appendix B to this report.

3. ECONOMIC BACKGROUND

Historically, the economy of British Columbia has been heavily dependent upon resource-based industries. Some of the most impressive economic progress the province has seen has come as a result of resource exploitation. The strong economic growth of the 1960's and 1970's was largely a product of the establishment of numerous pulp mills and other forest industry projects, the construction of major hydroelectric projects, the development of many new mines, and the creation of the substantial transportation infrastructure and supporting services required to facilitate the resource industries.

The resource-based industries will remain as key economic generators in British Columbia. However, major changes have taken place in the world economic order in this decade whose influence will in future will be pervasive in the global economy. These include the accelerating growth of high technology and

information-based industries, and the use of the products of these industries in other economic sectors. They include the emergence of vibrant national economies in a number of countries of Southeast Asia, and the economic ascendance of Japan. The increasing self-reliance of developing countries in agricultural and other resource commodities and their growth as low-cost producers of these for export markets is a key factor affecting the economic fortunes of British Columbia.

The ability of British Columbia's industries to introduce and to adapt to the fruits of technological progress will continue to have a major effect on the economic well-being of the province. Similarly, the continued growth of the province's burgeoning high technology industries, the continued fostering of new technologically-based enterprises, and the corresponding entrepreneurship in the long run will be vital factors in provincial economic progress.

In keeping with the new economic reality facing the province, the Government of British Columbia is establishing new policies, directions, and priorities. Against this background, the future direction of the British Columbia Institute of Technology has been examined by the task force and the supporting secretariat. The role of the Institute in providing appropriately qualified graduates and in facilitating technological progress in the province has been studied. The intent of this exercise has been to provide recommendations to help guide the development of B.C.I.T. to optimally support economic progress in British Columbia in the current and emerging context.

4. PROGRAM ANALYSIS

As indicated in the Terms of Reference for this task force, a key part of the analysis undertaken has focussed on the programs offered at B.C.I.T. Their relevancy was to be assessed opposite "---an expanded vision of the province," and a desire that the Institute have a unique (high technology) role within the post-secondary educational system of British Columbia.

A listing of these programs and options and their enrollment is contained in Appendix C to this report and is summarized in Table 1 on the following page.

What is immediately obvious from even a cursory review of these programs is that there are a number which clearly do not fit the vision of the future for B.C.I.T. Those programs for the most part are in the trades training area. If the intended orientation of B.C.I.T. is to be achieved, these would have to be either transferred elsewhere or deleted.

In consultation with the Institute, a list of those programs which do not fit the perceived criteria for inclusion in future offerings by B.C.I.T. has been drawn up, and their priority ranking in terms of potential transfer has been assessed. The programs have been grouped according to the degree of capital cost likely to be involved. A list categorized according to the priorities involved and the corresponding potential net savings for operating purposes is contained in Appendix D, and is summarized in Table 2 on page 7.

5. COST IMPLICATIONS OF TRANSFERRING PROGRAMS

As shown in Table 2, there are four categories of programs which in roughly equal operating cost increments define some 66 programs or subprograms which might be transferred or eliminated from B.C.I.T. Taking account of costs attributable to these programs as well as offsetting tuition and other revenues, the elimination or transfer of these programs would reduce required annual provincial government funding to B.C.I.T. by some $6 million. Currently that funding totals approximately $55 million.

A review of the programs involved reveals that a large majority are trades training, and nearly all would have to be transferred elsewhere as opposed to being dropped completely (see Appendix D).

According to a study previously carried out by Price Waterhouse, B.C.I.T.'s instructional costs are not generally higher than those of the colleges.

TABLE 1

BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY
SUMMARY OF ENROLLMENT, PROGRAMS AND OPTIONS

(Full Time Enrollment as of October 2, 1987)

	ENROLLMENT 1st YEAR	2nd YEAR	TOTAL	NUMBER OF PROGRAMS	OPTIONS
Engineering Technologies Programs	961	711	1,672	18	43
Business Programs	621	685	1,306	6	22
Health Sciences Programs	252	391	643	10	10
Core Academic Programs (in totals above)					
Trades Training				44	44
TRAC/Entry Level Trades Training	963,000 student* contact hours			-	-*
*Included in Trades Training					
TOTAL				78	119

For complete listing of enrollment by program, see Appendix C.

TABLE 2

SUMMARY
PRIORITY ADJUSTMENTS
PROGRAM PROFILE
B.C.I.T.

ITEMS	PRIORITY	CATEGORY	AMOUNT*
1 - 19	One	Minimum adjustment to facilities or capital equipment	$1,449,763
20 - 35	Two	Some adjustments to facilities and capital equipment, renovations of B.C.I.T. space required	1,738,064
36 - 49	Three	Major renovations to B.C.I.T. facilities, programs may be moved to other locations by moving equipment currently at B.C.I.T.	1,382,550
50 - 66	Four	Major renovations to B.C.I.T. facilities, new facilities may be required at other locations, or other B.C.I.T. programs are affected by move	1,415,556
		Total	$5,985,933

*Current Annual Direct Costs

Transferring programs would therefore have little overall effect on provincial government costs, particularly on the trades side. It would be difficult for B.C.I.T. to reduce its support costs in the short term, while the receiving colleges would automatically receive support cost allocations under the funding formula. Finally, we would expect some significant capital expenditures to be needed.

Even a wholesale transfer of trades programs out of B.C.I.T. would not lead to substantial support cost savings. Following the B.C.I.T./P.V.I. merger, B.C.I.T. made savings for the merged institutions of approximately $2,000,000 in staffing costs, and reduced the management structure for trades to a minimum. There is little left to cut; plant costs would be reduced, but this would be offset by costs increasing at other institutions.

For those programs identified, cost savings have been described reasonably accurately in Appendix D. There would be some additional savings in support costs, but these would be offset in the medium term by costs of dislocation and severance.

If it were decided that some aspects of trades training should be withdrawn from B.C.I.T., the problem of physical facilities would have to be resolved. The physical facilities for trades training at B.C.I.T. were the first structures erected on this site. They generally are well suited for the purpose. The present value of these facilities is roughly $117 million, with the value of buildings being approximately $89 million. The physical withdrawal from B.C.I.T.of the significant proportion of trades training itemized in Appendix D would not involve the full level of capital cost indicated above, but would still involved the expenditure of at least several tens of millions of dollars.

6. OTHER IMPLICATIONS OF TRANSFERRING PROGRAMS

The transfer or elimination of the programs listed in Appendix D would improve the high technology image of B.C.I.T. However, it would leave the Institute far

short of the "beacon of technological excellence", and certainly not a "world class leader in technology". The vision which the provincial government would like to achieve would not be realized.

This separation also would have some negative effects in addition to the capital cost aspects. One of these would be the impact of fracturing the trades training which has been integrated at the Willingdon Avenue site for many years.

The trades training facilities at B.C.I.T. and the training offered there are regarded by the British Columbia construction industry and the trade unions as a very important underpinning to the industry. In this context a number of representations have been made to this task force in writing and in the course of meetings at which a spectrum of the trades was officially present.

A majority of the tradespeople in British Columbia reportedly were trained in these facilities. Some 63 percent of apprenticeship training in British Columbia still is carried out there. As might be expected from population distribution and demand for tradespeople, these apprentices and the trained tradespeople generally are residents of the Lower Mainland.

In some disciplines (e.g. electronics), the trades and technologies are growing closer together, and are in effect beginning to form a continuum. This is being reflected in an increase in common training for elements of the education of electronics tradespersons, technicians, and technologists. This is demonstrated in Appendix E, which illustrates proposed bridging from electronic trades training to electronic technologies training. These or similar arrangements have been proposed or embarked upon by at least two community/regional colleges in addition to B.C.I.T. The need for continued physical proximity is obvious. Thus, an argument can be raised in favour of keeping trades training together as well as keeping related trades and technologies together.

A key reason for the trades and technologies growing closer together is that increasingly the trades have to install and maintain high technology equipment.

For example, B.C.I.T. is heavily involved in a major retraining program for tradespeople in the Prince George area, where the major pulp mills and other industry are converting more traditional electrical control systems to state-of-the-art programmable controllers.

One of the points made in representations to the task force and one which fits with other information which we have been provided is the need for improved input from the joint industry - labour boards in terms of specific influence over the delivery of trades training. There needs to be a more direct means for these stakeholders in the service to influence the conduct and staffing of trades training programs, including the introduction of new technological developments and the upgrading and technologically current proficiency of instructional staff.

We have been informed that past dissatisfaction with the situation at P.V.I. was a primary determinant in the establishment of competing or replacement training schools by industry and labour. Some of the representations we have had indicate a desire to review this separation and move towards a rationalization of facilities and programs. For example, The Mechanical Contractors Association of British Columbia in a written communication made several constructive suggestions on this subject.

At the same time, the Principal of Vancouver City College has suggested that there is a need to rationalize trades training between institutions. Similarly, the Principal of Douglas College has pointed to unused trades training facilities at that institution.

7. POTENTIAL FOR ORGANIZATIONAL SOLUTION

The physical separation of a significant part of trades training from B.C.I.T. might not be the best approach. The key to the situation may well be defining an appropriate organizational solution applicable to the current trades

component of B.C.I.T. Hopefully one could be found which would continue to facilitate the synergy which has begun to appear at B.C.I.T. between some of the major trades (e.g. electrical) and the corresponding technologies. This arrangement is beginning to facilitate technology transfer to the trades as well as to provide bridging opportunities for tradespersons to advance into corresponding technology.

An organizational model which might be worth considering for the governance of trades training involving at least these three institutions (V.C.C., B.C.I.T. and Douglas College) and potentially others in the Lower Mainland could be a Trades Training Authority. Such a body might have some training delivery capacity which it manages itself, and other capacity which essentially is subcontract capacity. This body would govern trades training under the applicable regulations, government direction, curriculum, etc. as at present, but would have the authority to determine where and how trades training would be delivered.

The Authority could take over active management of a part of the trades training facilities currently at B.C.I.T., under a minimal management structure reporting to the Board of the Authority. Other aspects of trade training where there is integration with the technologies could remain as is but subcontracted to B.C.I.T. by the authority. Still other facilities whether at a college or a private school could come under the umbrella of the authority. There would be potential for privatization of existing facilities or the introduction of new private facilities.

The Authority could be governed by a Board of Directors representing the various stakeholders in trades training, including representatives from the Ministry, the joint boards concerned with apprenticeship, the institutions involved, and others as appropriate. Subcommittees of the board or revamped Trades Advisory Committees could be given relatively direct authority to monitor trades training, including the performance of instructors and their current knowledge of subjects taught. These committees ought to be in a position to demand change of the curriculum or other key aspects of instruction.

8. AN ALTERNATE ORGANIZATIONAL SOLUTION

If it were decided that the concept of a Trades Training Authority as outlined above were to not to be pursued, an alternate arrangement would be required. The status quo is not acceptable to the provincial government, nor is it desired by key stakeholders in trades training. The essence of an alternate organizational arrangement is embodied in the following extract from a submission received by the task force.

> Upon merging with the Pacific Vocational Institute B.C.I.T. assumed a reputation with business, industry, sponsoring agencies, and the trade unions which, for a variety of reasons, had become tarnished since its days as the British Columbia Vocational School (Burnaby). This negative attitude recently has been altered primarily as a result of our attempts to convince these groups to "buy into" the program redesign effort. To delete and transfer programs would fracture these fragile new bonds, and B.C.I.T. would find it difficult to regain its credibility as an institute that meets the needs of industry.
>
> The identity crisis that B.C.I.T.is presently experiencing was aggravated by the merging of trades' programs into its former identity as an institute of technology. A possible solution would be to select those programs that fit within its new definition as a center of high technology and give those programs a separate identity (e.g., B.C.I.T.) within the proposed definition. For example, trades' programs could be given an identity of their own (e.g., British Columbia Center for Trades and Employment Training). The new identity could be attained without losing the services now provided to existing programs and without creating the need for parallel administrative and support units.
>
> An additional benefit for the high tech programs would be close and easy access to the tools and expertise needed to transform ideas into reality. An example of an existing (project) is the development of (a specific unique machine). The services and expertise of the specific trades are necessary to turn (this type of technological idea) into reality. These services would exist on campus with the technology students doing design and the trades' students developing the design into a prototype. This and similar

joint projects indicate B.C.I.T.'s present and potential role as a research and development center and provide a vehicle for "bridging" between the trades and technologies.

To design a two or multi identity educational/training/development center would however require an altered organizational structure which, while not requiring additional management staff, would necessitate a vice president in charge of each of the individual centers. For example, there would be a Vice President of Trades and Employment Training as well as a Vice President of Technological Programs. Each would have to be an expert in their respective field and be accountable to the province for the cost-effective management of their domains. With provincially set goals this narrowed focus of responsibility would make their task more manageable. Funding necessary for the support functions could come out of each center's budget, just as a private company "rents" both space and services from a vendor. This cross-charging for services outside the domain of each center would result in cost savings because services would only be "purchased" if viewed as adequately meeting the needs of the center: increased service would result in increased purchases.

This strategy of separate centers would improve access to increased funding from outside agencies because the center developing the idea could obtain seed money from public or private sources. And the center turning the idea into a product would receive funding from CEIC for employment training as well as "cross-charging" the technology center for the work done in the construction of the prototype.

In essence this restructuring would accomplish the following:

- provide a separate identity for those technologies identified as "high tech" by distinguishing them from trade and employment programs,

- provide the tools and expertise necessary to move ideas from the drawing board to the market place,

- require each center (e.g. technology and trades), and the centralized support functions (e.g. Student Services, Community Relations, Audio Visual Services etc.), to operate more like a business, surviving or failing by the same rules followed by the private sector,

- reduce the drain on program budgets for unused support services while permitting program areas to accumulate and use generated revenue from training for sponsoring agencies, continuing education, and the development of new products. These sources of revenue would allow for program improvements beyond those presently possible through provincial funding,

- students would gain by being in an environment simulating business and industry. Working on a product which may reach the market place provides educational benefits to students who experience the realities and economics of production.

As an alternative to the Trades Training Authority approach, the concept outlined above would deserve consideration. It would fit with the organizational deletion of less relevant trades as discussed earlier in this report and as listed in Appendix D. Nevertheless, as in the case of a Trades Training Authority, it would not secure the realization of the vision outlined in the terms of reference for this task force.

9. THE PLACE AND ROLE OF TECHNICAL INSTITUTES

The following extracts adapted from a draft document provided from a source outside of British Columbia help to describe the place and evolving role of technical institutes in Canada.

> Technical Institutes, as the largest source of trained and skilled workers, are being called upon to play an important role in the economic development of Canada. Canada has four technical institutes of roughly equal size in terms of staff, educational facilities and general budgets.
>
> - Southern Alberta Institute of Technology (SAIT)
> - Northern Alberta Institute of Technology (NAIT
> - British Columbia Institute of Technology (BCIT) and
> - Ryerson Polytechnic Institute

Technical Institutes are primarily interested in the application of new technology to the changing world of production. The research carried out is not in the area of pure science but in the area of applications to improve productivity, efficiency and effectiveness of business and industry.

The New Role

The role of technical institutes in economic growth, whether in recruiting new industries, assisting industries to expand or helping small industries to be competitive, is relatively new. It has evolved recently and has yet to be universally accepted. However, rising unemployment and the competitive pressure from other countries are forcing us to revitalize our work force and to make our businesses more competitive in the domestic and world marketplace.

It is essential to recognize that technical institutes emphasize the development of skills, knowledge and attitudes that are needed in productive work that normally does not require a baccalaureate degree for entry.

Many graduates from universities enter technical institutes to acquire these skills and abilities. These technical institutes do not see themselves as being part of a hierarchy of post-secondary education but as distinct and separate entities with different missions, goals and objectives than either universities or community colleges. A good part of the future of technical institutes depends on their ability to meet the demands of the world of work for up-to-date, timely, career-related training.

The Role of Technical Institutes

Education and skill are two important attributes in determining the productivity and general availability of labour. The traditional view of technical institutes has been that they are useful to train youths to create a supply of skilled job seekers from which business and industry draw according to their needs. The demand side has been viewed only as a source of information to plan career related

program offerings. Thus the role of technical institutes has been viewed as being merely reactive to the expressed or projected needs of business and industry for trained job seekers.

A significant change in this role is being pursued by the technical institutes. Innovative "custom" training programs are being offered and delivered as quickly, effectively and at as low cost as possible to enable industry to meet its skill needs by training and educating its employed work force. Involvement in special or customized training affords the technical institute a direct stake in the economic growth of its community and province. Not only does this involvement add another dimension to career related education provided by the technical institutes, but it also helps youths and adults to obtain better employment opportunties.

10. TECHNOLOGY TRAINING AT B.C.I.T.

The programs of B.C.I.T. are organized within schools and other groupings encompassing related disciplines or logical divisions. These include the School of Business, the School of Health Sciences, the School of Engineering, Technology and Trades, and the Academic Core Programs. In all, there are over 78 programs having a total of more than 119 options within them. The lack of precision as to the exact number relates to the difficulty of classifying some such as those within entry Level Trades Training as separate programs or as options. A listing of programs is contained in Appendix A, and summarized in Table 1.

An historical record of the numbers of B.C.I.T. technology graduates (i.e. graduates of diploma courses in health sciences, business, or engineering technology) is shown in Table 3. To date, the total number of B.C.I.T. technology graduates approaches 27,000. For the most part, these individuals are actively involved in the fabric of British Columbia as outlined below.

The "old" part of B.C.I.T. is in essence an institute of the polytechnic type offering two year diploma programs and some one year post-diploma programs. The essence of the polytechnic type of institution is a strong orientation towards the application of the subject material taught, with close links to business and industry. The objective is to produce graduates who are immediately useful and well targeted to business and industry in the area of the institution.

TABLE 3

B.C.I.T. TECHNOLOGY GRADUATES

YEAR	BUSINESS	ENGINEERING	HEALTH	TOTAL
1966	67	242	-	309
1967	114	250	-	364
1968	160	276	-	436
1969	238	444	177	859
1970	295	513	239	1,047
1971	329	528	254	1,111
1972	335	518	221	1,074
1973	312	596	276	1,184
1974	310	599	342	1,251
1975	310	575	350	1,235
1976	297	527	304	1,128
1977	359	637	359	1,355
1978	417	637	376	1,430
1979	543	673	310	1,526
1980	577	671	121	1,369
1981	622	674	353	1,649
1982	649	637	353	1,639
1983	634	650	331	1,635
1984	690	706	326	1,722
1985	681	558	265	1,504
1986	723	562	274	1,559
1987	684	533	205	1,422
TOTAL TO DATE:	9,346	12,006	5,436	26,808

The polytechnic approach also involves imbuing students with a strong work ethic. This is accomplished in part through the intensity of the programs, including relatively larger numbers of contact hours and relatively heavy workloads. The intention is to produce graduates which generally are immediately more economically relevant than the more well rounded graduates of a university.

The following extract from a submission to the task force prepared by an advisory committee chairman captures the essence of the function of B.C.I.T.

> It is essential for B.C.I.T. to offer a curriculum of study that meets the needs of the community. By definition this should mean intensive and in-depth study in specific options and accompanied by a solid grounding in related core subjects. The curriculum must be based on teaching subject matter that is up to date in terms of current practices and technology and permits the student to be work - ready upon graduation. B.C.I.T. and B.C.I.T. graduates have earned the work - ready reputation in the past but only because of the necessary dedication of time and effort by staff and the immersion of students to their course of study. Unlike the colleges, a student at B.C.I.T. must make a commitment to B.C.I.T., and one self because success in a course of study at B.C.I.T. should not permit a putting in time attendance. The high reputation that B.C.I.T.has earned, and yet not adequately publicized, cannot be maintained or enhanced without a 32 hour diploma curriculum.
>
> B.C.I.T. as an institution of learning must be kept strong and vibrant with a reputation for supplying very skilled work - ready graduates.

11. B.C.I.T. STUDENTS

B.C.I.T. is heavily sought after by potential students. In 1987 there were an average 3.2 applications per available seat in health sciences, 2.6 applications per seat in business, and 1.6 applications per seat in engineering technologies.

Students entering B.C.I.T. are relatively mature, with the average age being 23 years. Approximately 60 percent are male, and 40 percent are female. Roughly two thirds were residents of the Lower Mainland in the previous year, with some one third employed full time during that period. One third are employed while attending B.C.I.T.

Only 15 to 17 percent of students entering B.C.I.T. come directly from secondary school. Thirty percent come directly from other post-secondary educational institutions, including 9 percent from universities.

Twenty-one percent indicate that a university was the last educational institution attended as a full-time student, and 10 percent are university graduates. Twenty-nine percent last attended community college as a full time student, and thirty-eight percent last attended secondary school.

The main objective of students entering B.C.I.T. is to learn job skills (approximately 50 percent), to change careers (15 percent), or to decide on a career (15 percent). Further statistical information concerning first year students entering B.C.I.T. is shown in Table 4.

B.C.I.T. is the predominant institution in British Columbia in terms of one and two year post-secondary level education programs in health sciences, engineering technology, and business. The numbers of students graduated by B.C.I.T. in these disciplines far exceeds the numbers graduated by any of the community colleges. (See Table 5).

Although the relative importance of B.C.I.T. is not as great as it was some years ago, the Institute still accounts for roughly a quarter of the business technology enrollment, two thirds of the engineering technology enrolment, and one third of the health sciences enrollment in the colleges/institutes system in British Columbia.

The increasing levels of enrollment in equivalent disciplines at the community colleges is a positive development reflecting improving regional access to this type of education and increasing the total capacity of the provincial system, which is straining to meet demand. Nevertheless, B.C.I.T. continues to play a key part, and is vital to meeting the needs of students resident in the Lower Mainland and to meeting the needs for graduates on the part of business and industry in the Lower Mainland and elsewhere in British Columbia. B.C.I.T. continues to play an important role in providing diploma, and post-diploma

TABLE 4

BCIT FIRST YEAR STUDENT PROFILE

P R E L I M I N A R Y R E S U L T S (1986)

SURVEY HIGHLIGHTS (percent)

	Fall 1986	Fall 1985	Fall 1984	Fall 1983
Major Activity Last Year:				
employed full-time	37.7	32.1	29.6	32.1
Post-secondary student	29.9	30.1	30.1	28.6
secondary school student	15.8	17.3	16.2	17.6
Female	40.6	36.5	36.1	38.6
Male	59.4	63.5	63.9	61.4
Average age (Actual)	23.0	21.8	22.7	22.0
Age groupings:				
18 and under	14.4	30.9	12.9	17.1
19 to 21	39.1	34.0	42.5	45.0
22 to 24	20.4	15.9	21.6	20.1
25 and over	26.2	19.0	23.0	17.8
Lower Mainland Resident last year	64.0	69.6	68.7	66.6
Employed while at BCIT	32.3	36.5	30.9	29.9
Have used software packages	42.6	41.6	35.3	n/a
Main objective is to:				
learn job skills	48.2	53.8	54.1	n/a
decide on career	15.6	13.1	13.2	n/a
change careers	15.7	12.9	12.1	n/a
BCIT was first choice institution	77.9	79.5	78.9	79.0
Decided on BCIT more than 1 year ago	25.4	24.7	30.6	26.4

The BCIT student profile collects information from all first year students during their first few weeks on campus. The survey is to help with BCIT program and recruitment planning. Comprehensive results will be published in report form.

TABLE 4

BCIT STUDENT PROFILE
FIRST YEAR STUDENT SURVEY
SEPT 87 & JAN 88 INTAKES

1. MAJOR ACTIVITY DURING THE PAST 12 MONTHS

	Total	Percentage
Secondary School	279	15%
Post-Sec (non-University)	373	21%
University	154	9%
Employed full-time	681	38%
Employed part-time	187	10%
Household	15	1%
Unemployed	110	6%

2. LAST EDUCATIONAL INSTITUTE ATTENDED AS A FULL-TIME STUDENT

	Total	Percentage
Secondary School	676	38%
Vocational	127	7%
Community College	519	29%
Technical Inst.	95	5%
University	385	21%

TABLE 5

PROGRAM ENROLMENT FOR
BUSINESS PROGRAMS
ENGINEERING PROGRAMS
HEALTH PROGRAMS

INSTITUTIONS	FULL TIME EQUIVALENTS FUNDED (1st and 2nd Year) BUSINESS	ENGINEERING	HEALTH	TOTAL
B.C.I.T.	1,569	1,560	683	3,812
Camosun College	575	287	272	1,134
Capilano College	572	-	-	572
Cariboo College	298	58	136	492
College of New Caledonia	293	150	144	587
Douglas College	385	-	145	530
East Kootenay College	684	25	-	709
Fraser Valley College	250	51	-	301
Kwantlen College	460	-	-	460
Malaspina College	207	71	45	323
Northern Lights College	-	-	-	-
Northwest College	45	-	30	75
Okanagan College	404	60	120	584
Open Learning Institute	305	-	-	305
Pacific Marine Institute	-	-	-	-
Selkirk College	135	170	64	369
Vancouver Community College	665	14	190	869
North Island College	120	20	16	36
TOTAL	6,847	2,466	1,845	11,158
B.C.I.T. AS A PERCENTAGE OF TOTAL	23%	63%	37%	34%

technological education programs in specialized functional areas. Typically these involve a need to concentrate a smaller number of students or more sophisticated training in an optimumally accessible location in terms of the geographical distribution of the province's population. Moreover, B.C.I.T. is the only institution in British Columbia devoted to the polytechnic type approach to graduating work - ready graduates highly relevant to the needs of the business and industry.

It is our understanding that a large majority of engineering technology graduates from B.C.I.T. find employment in British Columbia quite quickly after graduation. In contrast, it is also our understanding that engineering graduates from the University of British Columbia generally have much greater difficulty in finding employment, and that many if not most must find employment outside of British Columbia.

In our opinion, it is important to the long term economic health of British Columbia business and industry that B.C.I.T. continue to graduate relatively large numbers of diploma graduates in health sciences, business, and engineering technologies. These graduates are well received by business and industry in British Columbia.

Indeed, it is our impression that any prospect of a serious disruption to the supply of graduates from B.C.I.T. would be viewed very negatively by a large segment of business and industry in the Lower Mainland. Based on previous very vigourous representations resulting from proposed relatively minor program curtailments, and in the light of the response to this task force, we believe that very strong, forceful representations to high levels of the provincial government would be made by a large number of senior business executives and a great number of others in the Lower Mainland. The potential intensity of this reaction should not be underestimated. A highly pragmatic expression of this was forced upon us more than once by representatives of business and industry: "If it isn't broken, don't fix it!"

Based upon starting salaries offered, employers place a remarkably high value upon B.C.I.T. graduates in comparison with university graduates at the baccalaureate degree level.

In general, a high proportion of B.C.I.T. technology graduates are hired shortly after graduation, and at salaries that are not a great deal less than those received by university graduates with baccaleaureate degrees in comparable disciplines. Given the difference in public and private funds and student time invested to achieve graduation from B.C.I.T. in comparison with Universities, the Institute's performance must be judged successful by economic criteria. It would be unfair to apply the same test to community college students generally, since many of those are not enrolled in programs aimed at technological or business employment. We are not aware of any substantive data to indicate that community college graduates in business or engineering technology are any more successful or less successful than B.C.I.T. graduates in terms of the economic parameters mentioned above.

The question can be asked as to whether a business school has a place at an institute of technology. Demonstrably, it does. Even the Massachusetts Institute of Technology has a renowned program of management studies. We are given to understand that virtually all polytechnics around the world (including China) have a business school or the equivalent. The application of a polytechnic-type approach to business education appears to be equally as valid as its application to engineering technology or health science.

The following extract from the same submission to the task force by an advisory committee chairman quoted earlier in this report argues the case for the Business School continuing as an integral part of B.C.I.T.

> School of Business
>
> A school of business is essential at B.C.I.T. to provide the background base of knowledge to make things happen with modern tools and technology. The B.C.I.T. hands-on approach and working with business and industry, provides the

community both locally and abroad with work - ready graduates. Fundamental to the teaching must be that profit is not bad -- a principal not shared in many segments of academia. The teaching of the need for profitability and the taking of risk are inherent in achieving success. A success which ultimately provides employment, generates opportunity, pays taxes and supports institutions.

12. DIFFERENCE BETWEEN B.C.I.T. AND THE COMMUNITY COLLEGES

The preamble to the terms of reference for this task force state that "Despite the unquestioned progress that has been made since the merger of the B.C. Institute of Technology and the Pacific Vocational Institute, the Institute of Technology remains essentially indistinguishable from the College sector." However, in our relatively wide-ranging information gathering we came across only two groups who expressed this point of view. These were representatives of the community colleges, and some representatives of the Ministry. The balance of those with whom we consulted, including technical institutes in other provinces, representatives of business and industry who hire B.C.I.T. graduates, other knowledgeable observers, and of course the B.C.I.T. community, all see the Institute as distinctly different from the community colleges.

Some of the differences between the community colleges and B.C.I.T. are noted in earlier sections of this report. In particular, differences are outlined in those parts of this report which deal with the role of technical institutes and the nature of B.C.I.T. as an institution of the polytechnic type offering two year diploma and post-diploma programs. Other differences are analyzed below.

As indicated in the set of schedules comprising Appendix F, there is a clear difference in the emphasis of program offerings of B.C.I.T. in comparison with some of the larger and medium sized community colleges in British Columbia. In particular, B.C.I.T. has the only large apprenticeship program, has no university transfer programs, and a minimal amount of adult basic program enrollment. Within the vocational area, the distribution of B.C.I.T. program

enrollment generally is quite different from that of the community colleges (see Schedule II of Appendix F). B.C.I.T. Business School enrollment is proportionately much larger than is the case for business program enrollment at the community colleges. There generally is substantially greater enrollment proportionately in specialized health sciences programs at B.C.I.T. than in the colleges, and the same holds true for engineering technologies (Schedule III). B.C.I.T. has far more programs accredited by the Applied Science Technologists & Technicians of British Columbia, as shown in Table 6. B.C.I.T. also has numerous unique programs as shown in Table 7.

Based on the schedules of Appendix F, the division of enrollment between B.C.I.T. and Colleges seems logical in most cases, i.e.:

Technologies

Colleges offer most of the adult basic programs (such as English as a Second Language, High School preparation);

Colleges offer academic-oriented courses (University Transfer, "Career/Tech" such as music and fine arts);

In each of the "technologies", i.e., business, health and engineering, the colleges do the basic, core, intensive, high volume enrollment programs such as nursing, electronics, computing and business administration. B.C.I.T. has its own version of these core courses and offers the remainder of the program spectrum. However, there are a few courses which colleges offer in duplication of B.C.I.T. that are not in this category.

Trades

B.C.I.T. and Vancouver Community College (V.C.C.) together offer a reasonably representative mix. B.C.I.T. has high capital trades, VCC has commercial vocational programs.

From the above analysis, it is clear that in general there is a significant difference between the program profile of B.C.I.T. and the program profiles for the community colleges.

TABLE 6

APPLIED SCIENCE TECHNOLOGISTS & TECHNICIANS OF BRITISH COLUMBIA
ACCREDITED PROGRAMS

INSTITUTE	PROGRAM	LEVEL OF ACCREDITATION
BCIT	Biological Sciences	Technologist
	Biomedical Electronics	Technologist
	Building	Technologist
	Chemical Sciences	Technologist
	Civil & Structural	Technologist
	Electrical	Technologist
	Electronics (4 yr. apprenticeship)	Technician
	Wood Manufacturing Technology	Technologist
	Forest Resource	Technologist
	Mechanical	Technologist
	Mining	Technologist
	Petroleum Technology	Technologist
	Surveying	Technologist
CAMOSUN COLLEGE	Electronics	Technologist
CARIBOO COLLEGE	CAD Technology	Technician
MALASPINA COLLEGE	Energy Systems (Program suspended)	Technologist
	Forest Resource	Technologist
OKANAGAN COLLEGE	Civil	Technologist
	Electronics	Technologist
SELKIRK COLLEGE	Electronics	Technologist
	Arch./Mechanical Drafting	Technician
COLLEGE OF NEW CALEDONIA	Construction	Technician
	Forest Resource	Technologist
FRASER VALLEY	Drafting (Partially accred.)	Technician
KWANTLEN COLLEGE	Electronics	Technologist
	Electrical	Technologist

Source: Applied Science Technologists & Technicians of British Columbia

TABLE 7

PROGRAMS UNIQUE TO BCIT

Advanced Industrial Computing

Micro Electronics

Automation/Robotics

Mechanical Technology

Robotics
- Building Technology
- Civil and Structural
- Survey Technology

Bio-engineering

Trans. Syst.

Advanced Industrial Materials

Non-Destructive Materials

CAD (only one as a diploma)

Aircraft Sheet Metal

Avionics

Boiler Operation

Appliance Repair

Commercial Transport

Inboard/Outboard

Motorcycle Repair

Small Engine Repair

Benchwork/Joinery

Machinist/CNC

Plumbing/Upgrade/Steamfitting

Auto CNG LPG

Boilermaking

Ironworking

TABLE 7

Sheet Metal

Steel Fabrication

Saw-File

Industrial Instrumentation

Glazier

Insulation

Painting & Decorating

Pile Drive

Embalming

Health Care Management

Health Records Admin./Tech.

Medical Radiography

Nuclear Medicine

Occupational Health

Prosthetics & Orthotics

Sonography

Bio-Medical Electronics

Cytogenetics

Diamond Drilling

Forest Products

Mining

Natural Gas & Petroleum

Sausage Making

Upholstery

Meat Wrapping

Source: B.C.I.T.

What appears to have happened is that B.C.I.T. has continued to fulfill its role or mandate as originally intended. In the interim, community colleges have begun to offer some programs in business, health sciences and engineering technology, i.e. in areas where B.C.I.T. always has offered programs. Thus some overlap or duplication has grown up. In part this has been aided by B.C.I.T., which has helped to establish business and engineering technology programs at some community colleges. These began in part by offering one of the two years leading to a diploma, and eventually matured to the point where they were able to independently offer the second year as well.

Despite the moderate overlap outlined above, as indicated there remain major differences between the program profiles of the colleges and the program profile of B.C.I.T. In any event, we believe that some degree of overlap or duplication is positive and desirable, as argued below.

13. DESIRABLE DUPLICATION BETWEEN B.C.I.T. AND THE COLLEGES

A primary factor to be considered with respect to duplication is ease of access by the student population of the province. The major role played by B.C.I.T. in serving the province and the Lower Mainland in particular should not preclude the offering of technology programs where warranted elsewhere in the province.

A serious concern expressed at the meeting of the College of Principals which we attended was with respect to ascribing authority to a particular institution. The term "pedagogical leadership" in the terms of reference of the task force also was cited as a source of concern. Later in an independent meeting, one of the Principals noted that high technology increasingly pervades society. It is therefore increasingly important that all educational institutions include appropriate aspects of high technology in their programs, and be (reasonably) free to pursue the subject within their own mandates.

We agree with the point of view inherent in these remarks. The incorporation of advances in applied technology into the relevant curriculums of all colleges and

institutes should not be unduly inhibited. Specialized courses dealing with unique aspects of high technology might be restricted to a specific location. However, technological advances are accelerating in many fields, and need to be fairly quickly incorporated in instructional materials of corresponding courses or programs. The rate of diffusion of technology is seen by authorities as presitigious as the National Research Council as being vital to Canada's economic well-being. All of the regions of British Columbia should have reasonable access to instruction involving advanced technology, at least to the level which can be justified in terms of population, numbers of students, the requirements of business and industry in the region, delivery costs, and the equitable distribution of scarce financial resources.

There is another aspect of this subject which is important to the enthusiasm and effectiveness of individual faculty and institutions in the college system. There are a number of situations where individual faculty members or parts of these institutions have made noteworthy progress in the pursuit and teaching of high technology subjects. We understand that this has been achieved cost-effectively, in some cases with no appreciable increase in the cost of delivery of instruction. This freedom and the corresponding encouragement of individual initiative is commendable. Within the parameters described above, no action should be taken which could tend to suppress these activities.

On the other hand, in the case of the less common technologies, it is probably a retrograde step to offer these exclusively at a single college outside of the major areas of population unless a particular technology is unique to industry in a region. One of the reasons for this is the substantial living and transportation expenses incurred by a majority of the students affected. In addition, to the extent that local students are attracted to such a program, almost certainly they will be required to move to find employment, in contrast to remaining in their community if a more common technology were involved. Finally, there tend to be synergies between like technologies (e.g. in health sciences) which are lost if particular technologies are absent from the critical mass.

14. FRICTION BETWEEN B.C.I.T. AND THE COMMUNITY COLLEGES

It is quite obvious that there is and has been for many years friction between B.C.I.T. and the community colleges generally. In part this could be construed as a struggle over "turf" or functional position. However, it is clear that there are more deeply rooted and equally fundamental problems involved.

These are illustrated by the remarks made to us by a current faculty member at B.C.I.T., who prior to the merger was a faculty member at P.V.I. This individual noted that "We (at P.V.I.) used to regard B.C.I.T. as too large, arrogant, and uncooperative in the college and institute system." This arrogance and uncooperativeness has been perceived by much of the remainder of the college system.

There are good examples of B.C.I.T. actions and efforts to the contrary, such as fostering new programs at particular colleges. Current management at B.C.I.T. has been working to improve the situation. However, the strong negative impression which remains has left B.C.I.T. with a difficult legacy which in our view has hurt the Institute and likely will continue to hurt it until continued efforts over a long period of time help that negative image to attenuate.

Currently there are factors which are acting in the opposite direction. B.C.I.T. is seen as having sought special status, and as having used privileged channels to achieve that. The Institute is seen as seeking and receiving special financial treatment not accorded to other institutions in the college/institute system. In particular, the fact that B.C.I.T. is not on the funding formula applied to other institutions is a serious point of friction.

B.C.I.T. is also seen as an aging institution having an aging faculty and aging programs, which increasingly are being equalled or surpassed in quality by some of the community colleges. In this context, the favoured financial treatment appears to be doubly aggravating to the colleges.

Funding of a high technology centre at B.C.I.T. likely would be resented by elements of the community college system, and exacerbate the perception of favoured treatment for that institution. Some senior management personnel of colleges have already made the arguement that technological advances now permeate all aspects of the economy, and that the pursuit and teaching of these should not be limited to a single institution in one geographic area to the exclusion of others.

The image of B.C.I.T. as an arrogant, uncooperative institution is one which the Institute will have to work hard for years in order to overcome.

15. CENTRE FOR APPLIED TECHNOLOGY

There is a strong need for B.C.I.T. to continue to supply relatively large numbers of two year technology diploma and post diploma program graduates to fill the needs of business and industry. However, while achieving that the Institute can play an increasing role in applied research and in the transfer of relevant technology to business, industry and the workforce in British Columbia. This has been demonstrated by such developments as the ARCS laboratory, the IBEW - funded electrical/electronics project, and others. However, the potential of the Institute in this technology diffusion function is far from maximized.

The faculty and management of B.C.I.T. have proposed an innovative approach to regularizing and fostering this applied research and technology transfer activity. They propose that a Centre for Applied Technology be established at B.C.I.T. "---which would develop expertise in specific technologies and facilitate technology transfer to business/industry." This proposal is laid out in a document prepared by B.C.I.T. as a submission to this task force, and titled Economic Development through High Technology. A copy of that document accompanies this report.

The proposed Centre for Applied Technology would have several facets, including:

- Core Technology Centre;
- Development Assistance Centre;
- Industry Liaision;

- International Liaision; and
- Centre for Curriculum Design and Development

The interaction between these components is illustrated in the diagram on the following page, which is taken directly from the B.C.I.T. submission. the nature of the several facets or components of the Centre for Applied Technology is outlined in the B.C.I.T. submission.

We regard the proposal for a Centre for Applied Technology as a very worthwhile model. However, we are concerned as to whether B.C.I.T. is the appropriate vehicle for this ambitious project. In our view this proposed development and the desire of the provincial government for a "---world class leader in technology---" and "---an international beacon of excellence in technology training and education" brings to mind images of the Massachusetts Institute of Technology and the California Institute of Technology. The present B.C.I.T. is a very long way from these institutions in terms of level of students, programs, faculty, and function.

As has been argued earlier in this report, B.C.I.T. is fulfilling its mandate as an institution of the polytechnic type offering two year and post diploma programs in business, health sciences, and engineering technologies. The fairly large numbers of graduates it produces appear to suit the needs of business and industry, and are well received. We repeat that it would be a retrograde step to interfere significantly with this flow, and that such a move likely would generate very strong resistance among British Columbia business and industry.

In our view, the remaking of B.C.I.T. into the desired vision would also be a very difficult undertaking, requiring sweeping changes of faculty and management. Impediments involve the inertia of the institution, including its collective agreements with faculty and staff, its physical plant and the need for ongoing close relationships with trades training.

We believe that a fresh start would provide a better opportunity for success, probably would involve fewer risks of all types, and could cost less. In the following section of this report we outline a concept which we believe would be a much superior approach.

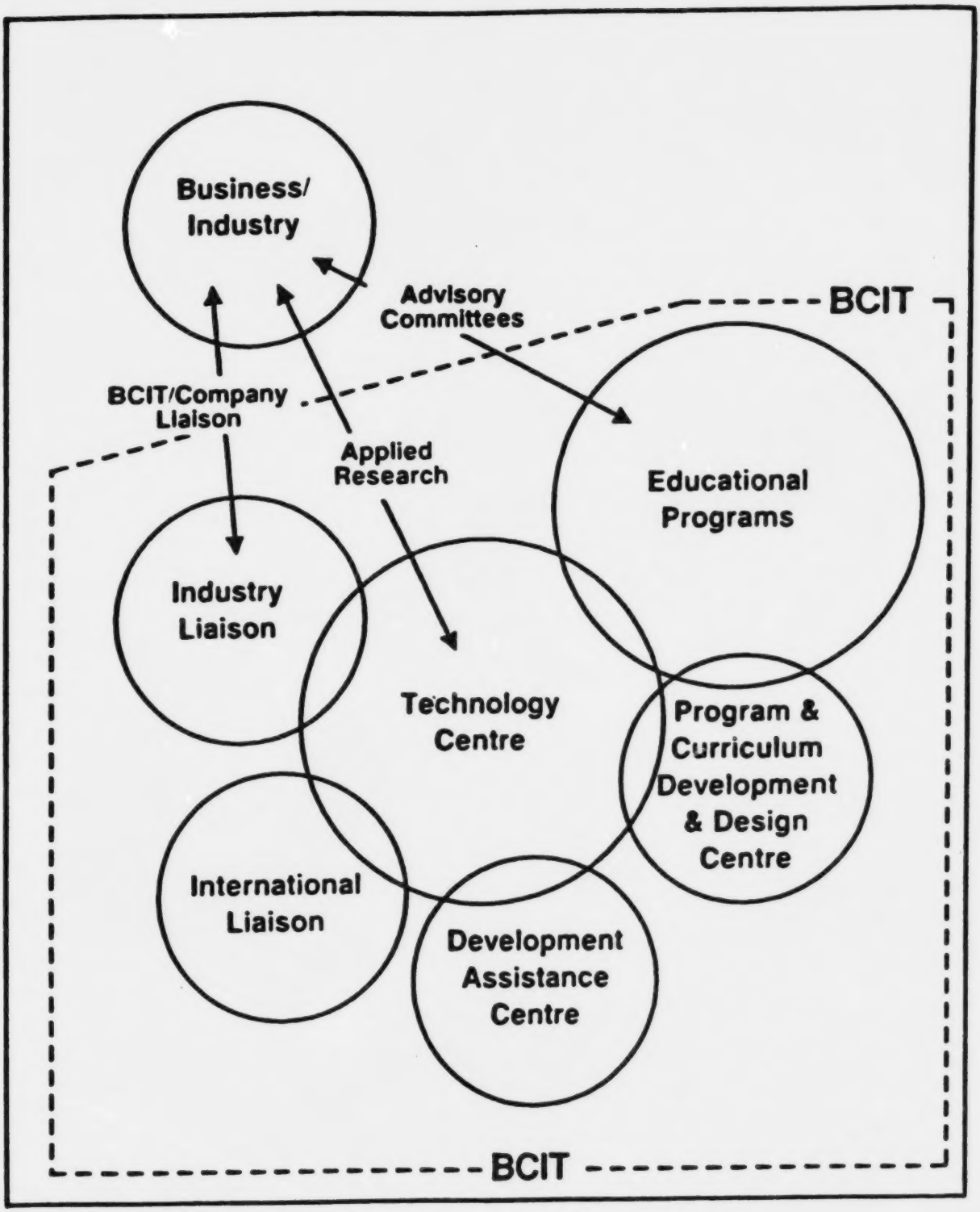

Diagram 1: Technology Centre Key Components

16. CONCEPT OF A COLLEGE OF ADVANCED TECHNOLOGY

Given the vision expressed in the preamble to the terms of reference for this task force, and in the light of our perception of the current realities of the post-secondary system of education in British Columbia, we are moved to suggest a concept for an institution that might have a reasonable expectation of fulfilling that vision.

We suggest that consideration be given to establishing a British Columbia College or Institute of Advanced Technology. Our vision is that such an institution would be relatively small, and elite. It would accept as undergraduate input only the brightest graduates of the two year diploma programs at the existing colleges and institutes of British Columbia, together with some reasonable proportion of comparable university students having achieved an equivalent standing. Some quota of outstanding diploma graduates or university transfer students from other provinces or other countries also would be accepted. The faculty would be carefully chosen from British Columbia and elsewhere, on the basis of their ability to perform in advanced applied technological research, on their abilities to transfer this to business and industry, and upon their ability to inspire excellence in a real world sense in the performance of superior students.

Some reasonably limited scope of disciplines would be required in this institution to guard against degrading performance through dilution of effort and lack of concentration of resources. These disciplines should be based in part upon the existing and potential economy of British Columbia, including its burgeoning high technology components. In this way there should be better prospects of the fruits of applied research to be utilized in this province, and for the industry liaison component of the institution to succeed.

Entrepreneurship and the commercial harnessing of technology would receive emphasis in the curriculum of such an institution rather than technological and scientific subjects alone. These qualities would be vital in graduates of the institution.

Clearly such an institution would be degree granting to at least the baccalaureate level. To achieve the "beacon of excellence" which is desired, postgraduate study would be desirable.

This would not be another university, but an institution in the polytechnic model. The relevance of its work and its graduates to business and industry would be a test of its success.

The small size, the nature and the quality of the proposed institution would have another advantage. Elsewhere in this report we question whether a degree graduates from a polytechnic type institution are required in British Columbia. However, the small number of graduates from the proposed institution, their quality, and their exposure and orientation to advanced technology transfer would suggest that they should have a reasonable opportunity for success in seeking employment here.

It is this institution that we believe would be fitting for the Centre for Applied Technology which B.C.I.T. has described. A similar, smaller centre would still be a worthwhile adjunct to B.C.I.T., though one involving expenditures substantially less than the $12 million annual operating and capital costs which B.C.I.T. has estimated. B.C.I.T. has significant additional potential to assist business and industry through technology transfer, but generally not at the level we believe is reflected in the preamble to the terms of reference for this task force.

As indicated, the College of Advanced Technology would be relatively small, and have as intakes the proven elite of the graduates of the college and institute system as well as other equally qualified university undergraduates. Entry to such an institution would be sought after. However, not only academic excellence would be involved in the selection of students who would enter at the third year post-secondary level. Qualities contributing to the successful application of applied research in business and industry would be a part of

these criteria. Energy, initiative, entrepreneurial orientation and other characteristics would be sought in incoming students.

This institution would not be another Ryerson, nor an extension of B.C.I.T. This institution would be elitist without apology. Its role would be an elite role, in contrast to the highly successful popularist and community role of the existing college system in British Columbia. Generally it would complement rather than compete with the existing post-secondary system of education in British Columbia. It should probably be separate from any existing institution and free of the impediments which are present in existing institutions.

Such an institution would offer a solution to the transfer problem which currently faces the outstanding college and institute graduates in British Columbia in most disciplines. Rather than having to travel to other jurisdictions and having to enter the university stream, they would be better served here in British Columbia. They would be encouraged to retain their practical or applied orientation rather than to become the more theoretically oriented or "well-rounded" university graduates.

Another feature of the small size of the institution should be closer contact between faculty and students. We believe that it should also be possible to minimize the management structure and the attendant costs, even though proportionately these might be high given the diseconomies of the smaller scale. Hopefully the relatively small scale of the institution would also be reflected in smaller budget requirements. Obviously there would be significant initial capital requirements.

To attract the brightest and best faculty, premium salaries likely would be required. These should not be offered with abandon; they should be carefully calculated to attract the required level of talent in terms of competing opportunities.

A function which this College of Advanced Technology could fulfill once it has been properly established is to deal with the continuing education requirements of two year technology diploma graduates who are employed but wish to upgrade their qualifications through continuing education. This function of the institution, as is the case at B.C.I.T., could be structured and managed so as to minimize any adverse effects upon the full time programs of the College. In this way, another of the significant deficiencies of the current situation in British Columbia would be addressed.

As in the case of other institutions active in continuing education, the College in its continuing education program within reason should endeavour to maximize access to residents of all parts of the province.

It is beyond the bounds of the work of this task force to attempt to offer much more than this conceptual design for a College of Advanced Technology. However, we believe that further exploration of this concept would be worthwhile. It appears to offer the potential to achieve the vision outlined in the preamble to the terms of reference of this task force.

17. GRANTING OF DEGREES

Some parts of B.C.I.T. have the potential to establish degree programs. However, we believe that the establishment of degree programs at B.C.I.T. would threaten the fundamental purpose of the institution, which is to produce graduates of two year diploma and post-diploma programs.

We have already made the point that these graduates are highly regarded by and important to business and industry in British Columbia. We also have cited information indicating that entrance to B.C.I.T. is sought after by far more students than the Institute can accommodate. The relevance of the B.C.I.T. technology programs to the economy of British Columbia is clear.

In our visit to Ryerson Polytechnical Institute, we were impressed with the advice of the President, Dr. Brian Segal. Dr. Segal is a respected figure in post-secondary education in Canada, and one who has a penetrating knowledge of the past transition of Ryerson from a diploma granting to a degree granting institution. Dr. Segal persuasively argued that where a degree-granting institution begins to grant degrees, the diploma programs tend to wither and disappear. This is what happened at Ryerson.

It is not clear that business and industry in British Columbia require degree graduates from a polytechnic institution. We understand that in the past industry has indicated that is not the case. Certainly the difficulty experienced by U.B.C. engineering graduates in finding employment in British Columbia is not an encouraging sign.

We again point out this consideration may not apply to the graduates of the proposed College of Advanced Technology, as discussed earlier in this report.

On the other hand, it is clear that business and industry as well as students want the diploma programs at B.C.I.T. We see little reason to disrupt those programs as a consequence of introducing degree programs.

It was suggested to us by the senior executive officer of a technical institute outside of British Columbia that institutional ambition may be a continuing threat to the relevance of an institution of technical education. In this statement he was referring to the tendency of these institutions to look towards degree granting status. We concur with the point of view which he expressed.

There are other problems associated with the possible introduction of degree programs generally at B.C.I.T. These relate in part to the academic qualifications of the faculty. While those are demonstrably adequate for diploma programs, we question whether they would be for degree programs.

In short, we see little point in the expenditure of public and private funds and the expenditure of students' time in degree programs at B.C.I.T. whose relevance to business and industry in this province is dubious. Particularly when such a

development might threaten the clearly desirable diploma courses at B.C.I.T., we cannot support degree programs for the Institute.

On the other hand, we do believe that it is highly desirable that outstanding diploma graduates from B.C.I.T. and from diploma programs offered by the community colleges should have available to them paths by which they can transfer to other institutions within the province to pursue degrees without sacrificing credit for academic work achieved. To some extent this is already happening with some health sciences graduates from B.C.I.T., who can transfer to Simon Fraser University. Credits are also available to business diploma graduates pursuing professional accounting designations. However, generally the two year diploma graduate must leave the province to receive full credit for the academic levels achieved here. This should not continue. Elsewhere in this report we suggest an innovative institution that would substantially alleviate this problem, at least for the brightest and best diploma graduates.

We realize that our position with respect to degree granting as stated in this section of our report likely would be challenged by some. We therefore present here a counter argument that suggests that in the long term degree granting levels will be desirable and will evolve. This argument is presented in a general context of two year diploma institutions rather than being specifically applicable to B.C.I.T.

Failure of technical education to keep pace with changing needs of those which it serves would be a disservice. With the continuing evolution and growing sophistication of technology and the growing sophistication of its application in many facets of society, corresponding enhancement of technical education is a necessity.

To an extent this can be accommodated through enhancements to an existing curriculum. In addition, continuing education in the sense of part time or short course academic offerings may meet some of the needs involved. Nevertheless, it appears that increasingly two year diploma programs in themselves may be inadequate to provide desired or required levels of applied technological education.

Post-diploma programs such as those offered at B.C.I.T. in the short run will meet a part of the requirements for additional technological education. These have the virtue of catering to the technologist with work experience who needs additional or varied education. However, it is to be expected that as technology progresses, even these will not meet the needs of a growing number of technologists and their employers. A natural evolution over a relatively long period of time would be to three year diploma programs, and eventually degree programs.

Indeed, there are knowledgeable observers who believe that one of the major defects in Canada's post-secondary education system is a lack of polytechnical institutions offering applied technological education to the degree level. They point to polytechnical or technological education in the United Kingdom, Europe, and the United States to support their contention that a major weakness in Canada's educational system is the lack of such facilities.

Canada has been reasonably well served by the one or two year diploma institutions offering technological education. Included among these are B.C.I.T., NAIT, SAIT, Kelsey, Ryerson, and some aspects of the community colleges and forerunners in Ontario. However, with the exception of Ryerson, none of these offers a polytechnical education to the degree level.

The economic and technological relevance of degree graduates from existing universities in Canada is challenged by this point of view. While the academic content of these courses is demonstrably satisfactory, the immediate relevance of the courses to business and industry and the orientation of their graduates leaves something to be desired. As a consequence, it generally requires some period of time to orient these graduates to the realities and requirements of the mainstream of economic and business activity.

18. INSTITUTE COSTS

In our discussions with representatives of community colleges, much comment was made concerning supposed favourable financial treatment of B.C.I.T. In

considering this subject, we have analyzed financial information concerning the Institute. This analysis was carried out by Mr. Robert Elton, C.A., of Price Waterhouse, either in the course of an earlier study of funding of B.C.I.T., or during the current review.

This analysis shows that in terms of direct instructional costs, B.C.I.T. generally has a lower cost per student contact hour than the average for the college system. There are some notable exceptions; one of these is nursing. Part of the reason for that anomaly is that as a result of transfers, B.C.I.T. has a preponderance of nursing students in the more clinically intensive and more expensive second year of the diploma program; this factor might hold true for some other programs. In any event, a more detailed analysis of this difference in instructional costs is outside of the scope of this review.

A cost-related subject is the number of student contact nours at B.C.I.T. We understand that this generally is higher than at community colleges. Further, we understand that this is a part of the approach to an intensive, work-oriented education which produces graduates of immediate utility to business and industry and with an ingrained work ethic. The very positive regard of business and industry for B.C.I.T. graduates, the high percentage of these graduates which find employment within a short period of time, and the relatively high starting salaries of these graduates in comparison to university graduates is testimony to the success of this approach.

Despite the favourable comparison of B.C.I.T. with the college system generally in terms of costs per student contact hour, it is our understanding that the results of Mr. Elton's previous study indicated that B.C.I.T. like other institutes of technology has higher support or administrative costs relative to program costs than do colleges. Despite this, during Mr. Elton's previous work and during the current review, opportunities were identified which would lead to reduced support or administrative costs at B.C.I.T. These are noted in Appendix G. Some of these would require an organizational study to verify them, which is

beyond the mandate of this task force. Other potential areas of cost saving or approaches to augmenting the sources of funding or other resources of the Institute are dealt with in the context of other parts of this report.

19. FUNDING

A very serious problem faced by both the Government of Canada and by the Government of British Columbia is the shortage of revenues to meet all of the competing demands for government expenditures. Both governments have been running substantial deficits, borrowing funds to make up the difference between revenues and expenditures or transfer payments. The Government of British Columbia recently has committed itself to a substantial reduction in its deficit.

In the face of this, it is significant that the provincial government has indicated a willingness to maintain current funding levels at B.C.I.T., provided that the Institute is able to show that the funding would be utilized for purposes that are in keeping with the government's vision of the role of B.C.I.T. as an institution committed to the furthering of high technology in British Columbia. On the other hand, there are funding requirements at B.C.I.T. which collectively may exceed the capacity of the funds available from government. A number of these relate to capital expenditures, where during the recession of the past several years the funding available for capital purposes for post-secondary educational institutions in the province was of necessity substantially curtailed. It may be very difficult to overcome the effects of past capital shortages.

Given these realities, it appears that B.C.I.T. should aggressively pursue alternate funding sources and donations of equipment. The Institute has done this in the past, and is doing so now to some extent. The previous capital donation campaign and the current President's Club appeal are leading examples of these efforts.

It appears that for the Institute to attain a level of funding and other resources which is more adequate to sustain and expand its efforts, additional specific policies and projects should be adopted. The efforts to identify and secure project-oriented operating funding should be stepped up. The significant successes achieved in private sector, union, and alternate public sector funding for such projects as the ARCS laboratory and the I.B.E.W. - funded electrical/ electronics project should be multiplied to the extent that this can be achieved. As an indication of the benefits possible through such a strategy, we have been informed by the President of S.A.I T. that this type of approach has assisted that institution in significantly lowering its dependence on provincial government funding.

In our meetings with representatives from business and industry, we have been struck by the strong support voiced for B.C.I.T. and the quality of students which it graduates. The starting salaries offered to B.C.I.T. graduates in comparison to, say, university graduates, tends to confirm that high regard. We believe that it should be possible for the Institute to capitalize more fully upon this positive regard.

In particular, we believe that a worthwhile project which would strengthen an important part of the Institute and which could result in significant operating economies could attract substantial support. We understand that at present the Business School at B.C.I.T. generally has to restrict class sizes because of the limitations of the facilities in which it operates. A new building to house larger lecture halls would permit larger class sizes, and result in a lower cost per student. That could be translated into a worthwhile combination of reduced operating costs and increased numbers of students. The Business School is one of the parts of the Institutes which has to turn away quite large numbers of qualified applicants. We believe that a fund-raising drive directed explicitly towards the construction of a building to augment the School of Business would be a worthwhile endeavour that would have good prospects for success.

20. FACULTY RENEWAL

One of the problems facing B.C.I.T. is that a significant proportion of the faculty is aging (i.e. are within, say, five to ten years of retirement). A significant proportion of those that are aging may not be keeping abreast of advancing technology, and may not be applying the level of energy and enthusiasm to their work that is desirable. B.C.I.T. is not alone in this problem; we understand that Ryerson and other institutions may face the same difficulty. This has come about in part due to the fact that instructors hired for this type of institution should have had substantial experience in business or industry before joining the faculty. The growing age of the Institute also is a contributing factor. Finally, the demographics of the population at large contribute to the situation.

The 1985 report of the External Audit Team on the five year review of B.C.I.T. commented on this subject as follows:

> Whereas, in various disciplines, the calibre of faculty is deemed high, there are definite areas where currency is of significant concern.
>
> A formal and well-subscribed professional development program is not in evidence.

We are aware that the management of B.C.I.T. recently has taken steps to rectify this problem. The effects of these measures remain to be seen.

A number of measures should be implemented to combat this problem. These should include incentives for faculty to keep up to date, built into performance evaluation. They should include the deliberate cultivation of a value set among the faculty which recognizes updating of technical knowledge as a very positive factor. They should include adequate release time or mini-sabbaticals on a more frequent basis but for a shorter period of time than currently provided for. There should be a corresponding formal obligation to undertake activities providing technical updating. In addition to courses, conferences, and other contact with knowledgeable authorities, this should include active participation

with knowledgeable authorities, this should include active participation with business and industry in settings which will enhance the faculty member's knowledge of advancing technology and its applications.

To encourage this type of activity, more adequate funding should be provided for faculty attendance at conferences, etc. The current average level of $300 annually is inadequate to support this activity. While the Institute is in a difficult position with respect to the availability of funds, it might be better to nave slightly fewer faculty with significant increased financial support for their technological or professional upgrading.

The Centre for Advanced Technology concept proposed by B.C.I.T., even if scaled down in size, likely would have a positive effect upon staff efforts to keep abreast of and to exploit technological advances. The competition involved, the rewards and recognition flowing from participation in the Centre, and the overall impact on faculty morale and value sets could have quite positive effects.

Another aspect of faculty renewal is the need for a continual inflow of new faculty. As the faculty ages, this should be matched by an inflow of younger, well qualified new faculty members who bring current knowledge of advancing technology and its application in business and industry.

Coupled with this inflow should be an early retirement program to permit older faculty members to step aside. This would have to be carefully structured so that the better qualified and more capable, energetic older faculty members could be encouraged to remain.

In the application of these measures, B.C.I.T. like other institutions initially would be catching up in a situation which has developed over some period of time. Except for the early retirement measure and the corresponding recruitment of new faculty, the passage of additional time would be needed to effect change and to reach a maintained level of improved technological and like current knowledge generally among faculty.

21. FACULTY TRAINING IN INSTRUCTION

It is our understanding that new instructors taking up positions at B.C.I.T. do so without necessarily having had any training in the art of instruction. Previously there was a short (two or three week) course for them, which was discontinued due to financial constraints.

In contrast to this, secondary school teachers must pass years of post-secondary education before they are allowed to begin teaching. In contrast, the situation at the post-secondary level is alarming. Particularly given the industrial rather than academic background of technology instructors, some preliminary pedagogical training should be mandatory. In addition, progress towards a formal instructor's qualification should be required after faculty are hired. We understand that there is an established program which is well suited to this (the Instructor Diploma Program).

22. PROGRAM RENEWAL

Coupled with the question of faculty renewal is the subject of program renewal. It has been suggested to us that some of the programs at B.C.I.T. are aging, and that revision of their content may not have kept pace with advancing technology.

It is clearly impossible for this task force to adjudicate the currency of each of the programs at B.C.I.T. However, we can suggest that there should be a more effective mechanism for ongoing program review to help ensure that programs are regularly updated to ensure that they remain current and relevant. This mechanism should operate fairly regularly, perhaps every two or three years. It should involve knowledgeable authorities from outside the Institute, as well as the advisory committee concerned. The role and performance of advisory committee is dealt with in the following section of the report.

From information provided to us, it is clear that there have been significant numbers of new programs added to those which B.C.I.T. offers. A listing of program changes in engineering technology and health sciences is shown in Table 8. Clearly, the Institute has introduced a significant number of programs relevant to changing technology and changing needs of business, industry, and other employers of B.C.I.T. graduates.

A concern which has been expressed to us is that funding provided to B.C.I.T.(and for that matter perhaps other educational institutions) in response to requests to fund specific programs is not always directed there. Moreover, there does not appear to be any accountability mechanism to provide the funding source with information as to the disposition of the funds and the results achieved. Further, there should be emphasis on early program evaluation of these new programs to monitor the results achieved opposite the stated objectives, with a need to justify the continuation of the programs. Given the scarcity of public funds available for education, it is difficult to see why this type of reporting should not be more widely applied to post secondary education. The competition for funds is intense, and the availability of good information to facilitate rational funding decisions appears as a strong need, for B.C.I.T. and for other institutions.

We are also aware that at least some of the advisory committees in the technology area do not function as effectively as they should. Two meetings a year of perhaps two hours duration each is the extent of the activity of some advisory committees. Unless that is supplemented by a good deal of written information and individual work by committee members, that is hardly enough to ensure continued relevancy of a program. Moreover, in some cases faculty may not be amenable to following the guidance of the committee.

The 1985 report of the External Audit Team with respect to the five year review of B.C.I.T. touches on this subject:

TABLE 8

SCHOOL OF ENGINEERING TECHNOLOGIES & TRADES

Programs Added:

	1982	1983	1984	1985	1986	1987
Aviation						
Avionics						X
* revision of program						
* extension of program from 12-16 mos.						
Civil & Structural						
Highways		X				
Construction		X				
Geotechnical			X			
Water Resources			X			
Electronics						
Microelectronics				X		
Mechanical Design						
CAD/CAM				X		
Mechanical Systems (moved from building tech.)		X				
Robotics			X			
Plastics						X
Advanced Manufacturing						X
Spatial Information Systmes						X
Mechanical Ind. Training						
Commercial Transport Mechanics					X	
Auto NGV/LPG Conversions				X		
Auto Electronics Technician					X	
Machinist C.N.C. Operator						X
Tool & Die Technician (to begin in 1988)						
Industrial Maintenance Mechanic						X
Metal Ind. Training						
Applied Process Programs:						
GTAW Titanium					X	
Submerged Arc Welding					X	
Downhill Pipeline Welding					X	
Automated Welding Systems					X	
Plasma Arc Welding & Cutting					X	
Boilermaker:						
Fabrication of FRP Materials				X		
Ironworker:						
Erection of Curtain Wall Systems					X	
Process						
Bioengineering					X	
Quality Assurance/NDT						X

Renewable Resource						
Natural Resource Management					X	
Transystems				X		

Programs Deleted:

	1982	1983	1984	1985	1986	1987
Building Des. & Cnst.						
Drafting (Maple Ridge)				X		
Civil & Structural						
Highways				X		
Mechanical Design						
Recreation Facilities Mgmt.					X	
Metal Ind. Training						
Welder-fitter program	X					
Process						
Food Production					X	
Agri-Management					X	

Program Size Change

	1982	1983	1984	1985	1986	1987
Mechanical Ind. Training						
Machinist						
Apprentice (2 intakes added)						X
ELTT (1 intake added)					X	
C.N.C. (3 intakes added start '87)						X
Automotive Mechanic:						
Apprentice (added 2 intakes)				X		
NGV/LPG (1 intake)					X	
Heavy Duty Mechanic:						
Apprentice (2 intakes)					X	
ELTT (1 intake)					X	
Commercial Transport:						
Apprentice (added 6 intakes)					X	
Apprentice (added 1 intake)						X
ELTT (1 intake)						X
Millwright:						
Apprentice (2 intakes)					X	
Apprentice (2 intakes)						X
ELTT (2 intakes)						X

	1982	1983	1984	1985	1986	1987
Metal Ind. Training						
Ironworker Program (2 intakes)			X			
Sheetmetal Program (1 intake)			X			
Steel Fabrication (1 intake)						X
Boilermaker (1/2 intake)			X			
Welding:						
Level C (4 intakes)			X			
Level A/B (add 2 intakes)				X		
Trades/TRAC (1 intake)			X			
Courses Transferred from Maple Ridge Campus						
Mechanical Ind. Training						
Small Engines Group:						
Small Engines ELTT (1 intake start '87)						X
Motorcycle Mechanic ELTT (1 intake start '87)						X
Inboard/Outboard ELTT (1 intake start '87)						
Apprentice (added 1 intake						X
Diesel Mechanic:						
ELTT (1 intake)						X
Mechanical Occupational Core						X
Welding						X
Courses Eliminated from Maple Ridge Campus						
Electrical Trades						
ELTT					X	

TABLE 8

SCHOOL OF HEALTH SCIENCES

Programs Added:

	1982	1983	1984	1985	1986	1987	1988
Electrophysiology		X	X				
Diagnostic Medical Sonography		X	X				
Health Information HRA (2 yr Diploma) HRB (1 yr Certificate)			X	X			
Critical Care Nursing				X	X		
Neonatal Nursing				X	X		
Advanced Obstetrical Nursing				X	X		
General Nursing Transfer Program (RN)				X	X		
Emergency Nursing					X	X	
Occupational Health Nursing					X	X	
Northern Native Professional Nursing Program (RN)					X	X	
Cytogenetic Technology						X	X
Remote Access Nursing (RN)						X	X

> "The Institute depends heavily on its advisory committees for currency, relevance, and program direction. The frequency of meetings, in some cases, is sporadic and not as disciplined as it must be."

We suggest that there should be a regularized, comprehensive follow up to the work of advisory committees to ensure that they are functioning effectively as intended. It should not be left to the whim of faculty as to whether and how these committees function, and how faculty respond to the guidance they offer.

In the case of the trades, some more direct means of influencing the situation is required. This is dealt with elsewhere in this report.

23. CONTINUING EDUCATION

As a consequence of our interpretation of the mandate for this task force and as a practical matter given the limited time in which to complete our activities, we have not addressed in any substantive way the matter of continuing education programs offered at B.C.I.T., particularly the very large night school programs. We are aware that the night school program is well received, has a good reputation, and is financially successful. On the surface of it, we see little reason for concern.

Continuing Education increasingly is vital to maintaining the capabilities of a work force relevant to the quickening pace of technological change. It is an area where B.C.I.T. is well positioned to play a key role, and where the Institute has commendable accomplishments. An example is the major retraining program for tradespeople to deal with technological advances in process control at pulp mills and other industries in the Prince George area. The ongoing program of upgrading for Ministry of Highways maintenance employees is another.

The Institute should continue to deliberately position itself to continue and expand the delivery of continuing education offerings. In part this should be through means which extend access, such as the Open Learning system. Care should be taken to ensure cooperation and coordination with other institutions, particularly those who might feel a proprietary concern with respect to the subjects or geographic territory involved.

24. CONCLUSION

In the limited time available, we have tried to the best of our ability to respond to the terms of reference given this task force. We have endeavoured to sift the voluminous inputs we have received to find solutions which would best serve all of those who have a stake in B.C.I.T., while offering a means to achieve the provincial government's vision of a world class institution of technological education in British Columbia. We hope that the information, analysis, and recommendations put forward for consideration will materially assist in resolving this situation.

APPENDICIES

APPENDIX A

BACKGROUND INFORMATION AND TERMS OF REFERENCE

Province of British Columbia

NEWS RELEASE

MINISTRY OF ADVANCED EDUCATION
AND JOB TRAINING

RELEASED: Immediate
August 11, 1987
CONTACT: Lorne Thompson
387-6292

TASK FORCE CHARTS FUTURE COURSE FOR B.C.I.T.

Advanced Education and Job Training Minister, Stanley Hagen, and B.C.I.T. board of governors chairman Malcolm Wickson, today announced the appointment of a special task force to help direct the institute into the future of high-technology job training.

"The ability of British Columbia to adapt to new technology will be a significant factor in our future economic well-being," Hagen said, in announcing the appointment of David Park of Western Management Consultants of Vancouver as the one-man task force.

"Assuring that economic well-being means making sure that our institute of technology is providing the right technological training, with the right emphasis and the right goals."

"That's the mandate of the task force. The government attaches great importance to the work of the task force and Mr. Park will be assisted by a secretariat composed of staff from B.C.I.T., the office of Premier Bill Vander Zalm, and my office," added Hagen.

more . . .

The task force has been directed to prepare a report for Hagen by October 19, 1987.

Malcolm Wickson said the institute welcomed the assessment by the task force.

"The merger of the Pacific Vocational Institute and B.C.I.T. two years ago set the stage for an evolution of training. The task force's evaluation is a very useful part of that ongoing process of growth."

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PROGRAM AUDIT - B.C. INSTITUTE OF TECHNOLOGY

Despite the unquestioned progress that has been made since the merger of the B.C. Institute of Technology and the Pacific Vocational Institute, the Institute of Technology remains essentially indistinguishable from the College sector. There exist few elements that portray it as having a unique role within the post-secondary system.

The goal of the merger was to create a flagship; an institution that would assume a fundamental role in the Province's economic strategy, could provide pedagogical leadership to the system and would stand as an international beacon for excellence in technology training and education.

The Government accepts the fact that the creation of such an entity is not inexpensive - particulary in relation to capital asset acquisition. It would appear that the Institute's need for increased resources might be accomplished if steps were taken to clearly differentiate the Institute from the colleges. In other words, to give it a unique role, the Institute should probably reduce the generalist nature of its program profile and concentrate its efforts instead on programs that will lead to its recognition as a world class leader in technology. By careful program deletion, the required resources could be available to effect desired changes.

To this end, the Minister has decided to appoint a one-person Task Force to perform a program audit at BCIT. Assistance will be provided by a three member Secretariat. The audit is meant to identify those BCIT programs that could be offered within colleges so that the efforts of the Institute could be more clearly directed toward programs of a high tech nature.

TERMS OF REFERENCE

1. To assess the relevance of every program or program grouping offered within the current program profile.

2. To indicate possible deletions from the profile or enrollment reductions that would change the current focus of BCIT to one more in line with an expanded vision of the economic future of the province.

3. To attempt to define for the Institute a place within the educational spectrum that would clearly differentiate its role from that of colleges and universities.

4. To assess and recommend on the desirability of giving BCIT degree granting status.

APPENDIX B

LIST OF GROUPS AND INDIVIDUALS CONSULTED BY TASK FORCE

LIST OF GROUPS AND INDIVIDUALS CONSULTED BY TASK FORCE

Consultations with Individuals and Groups from
British Columbia Institute of Technology

The Board of Governors

Mr. R.V. Murray, President

Mr. Drug Svetic
Vice-President Education

Mr. Duncan MacPherson
Vice-President Finance

Group Meeting with B.C.I.T. Educational Administrators
(President, Vice Presidents, Deans, Associate Deans, others)

B.C.I.T. Educational Council

Dr. John D. Kyle
Dean, School of Management Studies

Dr. Brian Gillespie
Dean, School of Health Sciences

Dr. Henry Arthur
Dean, Educational Services Division

Ron Sterne, Dean
and Associate Deans
School of Engineering, Technology and Trades

Faculty
School of Business

Faculty
School of Health Sciences

Technology Faculty
School of Engineering, Technology and Trades

Trades Instructors
School of Engineering, Technology and Trades

Faculty
Educational Services Division

Chairmen of Advisory Committees
School of Engineering, Technology and Trades

Chairmen of Advisory Committees
School of Health Sciences

Chairmen of Advisory Committees
School of Business

B.C.I.T. Student Association Executive

B.C.I.T. Engineering Technology student representatives

B.C.I.T. British Columbia Government Employee Union Executive

B.C.I.T. Staff Society Executive

Dr. Joffre M. Berry
Director (Acting)
Development Assistance Centre

Consultations with Selected
Industry Representatives
(Group Meetings)

1. Regarding Engineering, Technology and Trades Programs:

Mr. Don Champion, Vice President
British Columbia Telephone Co. Ltd.

Mr. Klaus Deering, President
Glenayre Electronics Ltd.

Mr. Rob MacGregor, Manager
Employee Planning & Development
British Columbia Ministry of Transportation
& Highways

Mr. Chris Morris, Manager
Human Resources
MacDonald Dettwiler Associates Ltd.

Dr. Vern Ruskin, Manager
ABC Industries Ltd.

Mr. David Yannish, Manager
Prince George Pulp & Paper Ltd.

Mr. Fred Otte, Retired Manager
British Columbia Hydro & Power Authority

2. Regarding Business Programs:

Mr. Phil Barter, Senior Partner
Price Waterhouse
Vancouver, British Columbia

Ms. Jean Dann, Director
Hospitality Industry Education
Advisory Committee

Mr. Gerald Franciscovich, President
Chevron Canada Ltd.
Vancouver, British Columbia

Mr. Keith Gray, Vice-President
Education and Government Affairs
British Columbia Business Council

Mr. Doug Rutherford, Program Director
Radio Station CKNW
Vancouver, British Columbia

Mr. Dan Ulinder, Regional Manager
Edgecombe Investment Services Ltd.
Vancouver, British Columbia

3. Regarding Health Sciences Programs

Ms. Stella Black, Director of Nursing
Royal Inland Hospital
Kamloops, British Columbia

Ms. Heather Croll, Director
Patient Information and Records Department
Vancouver General Hospital

Ms. Pat Cutshell, Director
Registered Nurses Association of British Columbia

Mr. Jim Flett, President
Vancouver General Hospital

Mr. Bob Ford, President
Ford Laboratories
Richmond, British Columbia

Mr. George Harvey
Chief Public Health Inspector
Burnaby, British Columbia

Dr. Don Newman, Head of Radiology
Children's Hospital
Vancouver, British Columbia

Dr. H. Reynolds
Senior Pathologist
Metropolitan Clinical Laboratories
Vancouver, British Columbia

Consultations with Other Individuals
or Groups in British Columbia

Mr. Gene Nesmith
- retired
former Chairman, Hong Kong Bank of Canada
former Chairman, Vancouver Board of Trade
former Chairman, B.C.I.T. Development Committee

Mr. Gordon Thom
former President
B.C.I.T.

British Columbia and Yukon Building
Construction Apprenticeship Coordinators Committee

Mr. John Leech
Executive Director - Applied Science Technologists
and Technicians of British Columbia; and
President - B.C.I.T. Alumni Association

Mr. Paul LaBranche
Director of Professional Affairs
Applied Science Technologists
and Technicians of British Columbia

Mr. Inglis W. Edwards
Technology Advisor
Field Advisory Service
Industrial Research Assistance Program
National Research Council Canada
Burnaby, British Columbia

Mr. Harry Gray
Managing Director
Association of Professional Engineers
of British Columbia
Vancouver, British Columbia

Mr. Barry H. Williams
Director
Discovery Innovation Centre
Vancouver, British Columbia

Mr. Ralph L. Ralston
Technical Education Consultant
North Vancouver, British Columbia

Mr. Dave Fraser
Career Preparation Program Coordinator
School District No. 41
Burnaby, British Columbia

Mr. Peter Thompson
Vice-President Marketing
Discovery Parks Incorporated
Burnaby, British Columbia

Mr. Robert Plecas
Deputy Minister
Ministry of Intergovernmental Relations
Victoria, British Columbia

Mr. Gary Moser
Assistant Deputy Minister
Government Personnel Services Division
Ministry of Intergovernmental Relations
Victoria, British Columbia

Consultations with Representatives of Universities, Colleges and Other Institutes in British Columbia

Mr. David Strangway
President
The University of British Columbia
Vancouver, British Columbia

Dr. Willim Saywell
President
with Vice-Presidents and Deans
Simon Fraser University
Burnaby, British Columbia

Dr. Lloyd H. Morin
President
Camosun College
Victoria, British Columbia

Dr. Lew Dryden
Director, Student Services
Camosun College
Victoria, British Columbia

Dr. Douglas K. Jardine
President
Capilano College
North Vancouver, British Columbia

Mr. A. James Wright
President
Cariboo College
Kamloops, British Columbia

Mr. William Day
President
Douglas College
New Westminster, British Columbia

Mr. J.L. McInnes
President
East Kootenay Community College
Cranbrook, British Columbia

Dr. Peter Jones
President
Fraser Valley College
Abbotsford-Chilliwack
British Columbia

Mrs. Adrienne MacLaughlin
President
Kwantlen College
Surrey, British Columbia

Dr. Ken Galgardi
Director
Business and Technology Division
Kwantlen College
Surrey, British Columbia

Mr. F. Raymond Walton
Director
Trades and Vocational Division
Kwantlen College
Surrey, British Columbia

Mr. Charles McCaffray
Principal
College of New Caledonia
Prince George, British Columbia

Dr. Dennis Wing
President
North Island College
Comox, British Columbia

Mr. Peter Williams
President
Okanagan College
Kelowna, British Columbia

Dr. Glen Farrell
Principal
Open Learning Institute
British Columbia

Mr. J.C. Braconnier
Principal
Pacific Marine Training Institute
North Vancouver, British Columbia

Mr. Leonel Perra
President
Selkirk College
Castlegar, British Columbia

Dr. Paul Gallagher
President
Vancouver City College
Vancouver, British Columbia

Consultations with Staff of the Ministry of Advanced Education of British Columbia

Mrs. Isabel A. Kelly
Deputy Minister

Mr. Ron Woodward
Assistant Deputy Minister
Science, Technology and Job Training

Mr. Gary Bunney
formerly Director of University Programs

Dr. Jack Newberry
Director, Access Programs

Mr. Duncan MacRae
Director
Trades and Technical Programs

Mr. James Reed
Director, Distance Education

Dr. Grant Fisher
Policy Advisor

Dr. James Rae
Program Manager
Programs Branch

Members of Provincial Apprenticeship Advisory Board
and associated staff from the
Ministry of Advanced Education and Job Training

In addition, a group meeting was held with a large number of staff of the Ministry involved in areas pertinent to the work of the Task Force.

Consultations with Individuals
from Outside British Columbia

Mr. W.G. Johnson
President
Southern Alberta Institute
of Technology
Calgary, Alberta

Mr. R.W.D. Erhardt
Academic Vice-President
Southern Alberta Institute
of Technology
Calgary, Alberta

Mr. R.G. Miller
Associate Vice-President
Strategic Planning and Extension Services
Southern Alberta Institute
of Technology
Calgary, Alberta

Dr. S.G. Souch
President
Northern Alberta Institute
of Technology
Edmonton, Alberta

Mr. Fred Williamson
Vice-President Instruction
Northern Alberta Institute
of Technology
Edmonton, Alberta

Mr. Anthony Wilkinson
President
Lambton College
Sarnia, Ontario

Mr. William C. Weston
Director
Tridelta Market Research Ltd.
Ottawa, Ontario

Mr. Robert Gordon
President
Humber College
Toronto, Ontario

Mr. John Humber
Director
College Affairs Branch
Ministry of Colleges
and Universities
Toronto, Ontario

Dr. J.S. Dupre
Professor
Department of Political Science
University of Toronto

Dr. Walter Pitman
Director
The Ontario Institute for
Studies in Education
Toronto, Ontario

Dr. Brian Segal
President
Ryerson Polytechnical Institute
Toronto, Ontario

Mr. Robert A. Guerriere
Director
Office of Research and Innovation
Ryerson Polytechnical Institute
Toronto, Ontario

Mr. R.A.A. Oatridge
Director
Centre for Advanced Technology Education
Ryerson Polytechnical Institute
Toronto, Ontario

Mr. P. Dobson
Faculty Member
School of Business Management
Ryerson Polytechnical Institute
Toronto, Ontario

Dr. John L. Clark
Director
Hong Kong Polytechnic
Hong Kong

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APPENDIX C

BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY

PROGRAMS AND OPTIONS

BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY PROGRAM DATA

Full Time Equivalent Enrollment as of October 2, 1987*

ENGINEERING TECHNOLOGIES PROGRAMS

PROGRAMS	ENROLLMENT 1st YEAR	2nd YEAR	TOTAL	PROGRAM OPTIONS
Building Technology	64	45	109	Architectural Economics
Biological Sciences	49	45	94	Biological Engineering Food Processing Landscape Horticulture
Chemical Sciences	40	34	74	Industrial Chemistry Lab Chemistry Environmental Science and Pollution Control Pulp and Paper Extractive Metallurgy Physcial Metallurgy
Civil and Structural Technology	51	53	104	Geotechnical Highways Traffic Water Resources Construction and Structures
CAD/CAM	45	33	78	
Computer Systems	98	96	194	Engineering Systems Expert Systems Information Systems Management Systems Microcomputer Systems
Electronics	323	227	550	Electrical Power Instrumental & Process Automation Telecommunications Control Electronics Microelectronics
Forest Resources	107	77	184	Forestry Fish, Wildlife and Recreation

ENGINEERING TECHNOLOGIES PROGRAMS (cont'd.)

PROGRAMS	ENROLLMENT 1st YEAR	2nd YEAR	TOTAL	PROGRAM OPTIONS
Mechanical Technology	63	21	84	Design Manufacturing
Mechanical Systems	8	18	26	
Mining	10	3	13	
Natural Resource Management		-		
Quality Assurance Non-Destructive Testing		-		
Petroleum	6	-	6	
Plastics	15	-	15	
Robotics	36	26	62	
Surveying	30	33	63	Surveying Surveying Technician (1 Year) Photogrammetry
Wood Products Manufacturing	16	-	16	
TOTAL	961	711	1,672	

PROGRAMS - 18

PROGRAM OPTIONS - 34

* Includes part time day enrollment converted to approximately full time equivalents.

BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY PROGRAM DATA

Full Time Equivalent Enrollment as of October 2, 1987*

BUSINESS PROGRAMS

PROGRAMS	ENROLLMENT 1st YEAR	2nd YEAR	TOTAL	PROGRAM OPTIONS
Administrative Management	95	83	178	Admin. Mgmt. Systems Admin. Systems Personnel & Ind. Relations
Broadcast Technology	101	76	177	Radio TV Broadcast Journalism
Financial Management	136	233	369	Financial Mgmt. Accounting Finance
Hospitality and Tourism Administration	89	78	167	Tourism Hotel, Motel & Food Service
Marketing Management	200	215	415	Marketing Real Estate Studies Prof Sales Advertising and Sales Promotion Adv. Tech Marketing Small Business Development
Operations Management	117	67	184	Transportation, Distribution, and International Trade Operations Management
TOTAL	621	685	1,306	

PROGRAMS - 6

PROGRAM OPTIONS - 22

*Includes part time day enrollment converted to approximately full time equivalents.

BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY PROGRAM DATA

Full Time Equivalent Enrollment as of October 2, 1987*

HEALTH SCIENCES PROGRAMS

PROGRAMS	ENROLLMENT 1st YEAR	2nd YEAR	TOTAL	PROGRAM OPTIONS
Environmental Health	23	20	43	
Health Information	29	17	46	Health Record Technician (1 yr)
Medical Laboratory	59	51	110	
Medical Radiography	-	67	67	(Next intake Jan. 1988)
Nuclear Medicine	17	15	32	(Next intake Jan. 1988)
Nursing	67	156	223	
Occupational Health & Safety	17	19	36	
Prosthetics and Orthotics	-	10	10	(Next intake Jan. 1988)
Bio-Medical	32	28	60	Electronics
Electrophysiology	8	8	16	
TOTAL	252	391	643	

PROGRAMS - 10

PROGRAM OPTIONS - 10

* Includes part time day enrollment converted to approximately full time equivalents.

BRITISH COLUMIBA INSTITUTE OF TECHNOLOGY PROGRAM DATA

Full Time Equivalent Enrollment as of October 2, 1987

CORE ACADEMIC PROGRAMS

PROGRAMS	ENROLLMENT * 1st YEAR	2nd YEAR	TOTAL
Chemistry	-		
Communications	-		
Mathematics	-		
Physics	-		
Basic Health Sciences	-		

* Included in enrollment by schools.

BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY PROGRAM DATA

Full time Equivalent as of October 2, 1987

TRADES PROGRAMS

PROGRAMS	ENROLLMENT
Auto Mechanic - Apprentice & ELTT*	449
Baking - Apprentice	16
Benchwork/Joinery Apprentice, Upgrading & ELTT*	-
Boilermaker - Apprentice	-
Bricklaying - Apprentice	16
Carpentry - Apprentice & ELTT*	-
Cooking - Apprentice	32
Commerical Transport - Apprentice	16
Electrical - Apprentice	
Electrical Motor Winder	16
Electronics - Apprentice	16
Embalming Apprentice	-
Floorcovering Apprentice	-

*Entry Level Trades Training.

TRADES PROGRAMS - (cont'd.)

PROGRAMS	ENROLLMENT
Glazier Apprentice	-
Heavy Duty Mechanic - Apprentice & ELTT	- 16
Horticulture - Apprentice	16
Instrumentation - Apprentice	12
Ironworker - Apprentice	-
Machinist Apprentice & ELT	16 41
Millwright Apprentice	16
Painting & Decorating Apprentice	-
Piledriving - Apprentice	-
Plumbing Apprenticeship & & ELTT	400
Refrigeration - Apprenticeship	16
Saw Trades Apprentice	94
Sheet Metal - Apprentice Apprentice	16
Steel Fabrication - Apprentice & ELTT	-
Tilesetting - Apprentice	16

TRADES PROGRAMS - (cont'd.)

PROGRAMS	ENROLLMENT	
Aircraft Maintenance Engineer and Structure Avionics	135	
Appliance Repair	46	
Baking - Commercial	48	
Barber/Stylist	14	
Computer Numerical Control	11	
Cooking - Short Order Institutional Banquet - (Professional)	176	
Diamond Driller - PE & OU	-	
Drafting	50	
Electronics Core	14	
Forestry Crewperson - 5 months	-	
Industrial Education Teacher Education	-	
Industrial Maintenance Mechanic	7	
Retail Meat Processing & Wrapping	71	
Sausage Making & Smoked Meats	16	
Upholstery - Automotive	16	Custom (Furniture)

TRADES PROGRAMS - (cont'd.)

PROGRAMS	ENROLLMENT
Welding - - C/B/A & Upgrade	200
TOTAL	2,040

PROGRAMS - 44

PROGRAM OPTIONS - 44

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APPENDIX D

PRELIMINARY LIST OF PROGRAMS WHICH MIGHT BE TRANSFERRED ELSEWHERE OR DELETED

SUMMARY
PRIORITY ADJUSTMENTS
PROGRAM PROFILE
BCIT

ITEMS	PRIORITY		AMOUNT
1-19	ONE	MINIMUM ADJUSTMENT TO FACILITIES OR CAPITAL EQUIPMENT	1449763
20-35	TWO	SOME ADJUSTMENTS TO FACILITIES AND CAPITAL EQUIPMENT, RENOVATIONS OF BCIT SPACE REQUIRED	1738064
36-49	THREE	MAJOR RENOVATIONS TO BCIT FACILITIES, PROGRAMS MAY BE MOVED TO OTHER LOCATIONS BY MOVING EQUIPMENT CURRENTLY AT BCIT	1382550
50-66	FOUR	MAJOR RENOVATIONS TO BCIT FACILITIES, NEW FACILITIES MAY BE REQUIRED AT OTHER LOCATIONS, OR OTHER BCIT PROGRAMS ARE AFFECTED BY MOVE	1415556
		TOTAL	5985933

REMARKS

The following remarks are related to specific trade programs and trade clusters.

FOOD TRAINING

If moved, the program would require new facilities, but more important, the product has to be consumed. BCIT is an ideal location because of the large student population and cafeteria system designed to make use of the cooked food.

MECHANICAL TRADES

Centralization results in greater industry support in the area of capital equipment and the opportunity for the provision of dealer training. BCIT is currently discussing dealer training with General Motors and has recently received seven new automobiles. This support would be more difficult to attain if automotive training were decentralized.

FACILTITIES

Steel Fabrication, Welding, Painting/Glazing, Carpentry, Millwork, Plumbing, Heavy Duty, Automotive, Food Training, Bricklaying, Electrical and Machinist have dedicated facilities on the BCIT campus. In many cases these facilities would have to be built at another location. In all cases, moving programs would result in major renovations for BCIT.

TRAC

TRAC contributes to a more effective utilization of expensive capital equipment.

ELTT BASIC TRADES SKILLS

Since this activity is a coordination and general component for all TRAC courses, part would have to remain as long as any TRAC programs remained. This is the reason for phased reduction.

1987 10 06

PRIORITY ONE
MINIMUM ADJUSTMENT
FACILITIES OR CAPITAL EQUIPMENT

	PROGRAM	SUB PROGRAM	SAVINGS
1	APPLIANCE SERVICING		151370
2	APPRENTICE	HORTICULTURE	23760
3	AUTO UPHOLSTERY		33870
4	CUSTOM UPHOLSTERY		36110
5	DIAMOND DRILLING		19790
6	DRAFTING		177270
7	EMBALMING		7200
8	FLOORCOVERING		16080
9	HAIR STYLING		12000
10	HEALTH	ENVIRONMENTAL HEALTH	183200
11	HEALTH	HEALTH INFORMATION	127480
12	HEALTH	OCCUPATIONAL HEALTH	83296
13	INSULATION		20320
14	MOTOR WINDING		52435
15	PILEDRIVING		5776
16	REFRIGERATION		55232
17	SMALL ENGINES		135496
18	TRAC	HORTICULTURE	109078
19	WELDING	WELDING (PART 1)	200000
		TOTAL	1449763

PRIORITY TWO
SOME ADJUSTMENT TO
FACILITIES & CAPITAL EQUIPMENT
RENOVATION OF BCIT SPACE REQUIRED

	PROGRAM	SUB PROGRAM	SAVINGS
20	BRICKLAYING		91600
21	COOKING	SAUSAGE MAKING R.A.C.	49450
22	COOKING	PROFESSIONAL COOKING APPRENTICE	87800
23	COOKING	PROFESSIONAL COOKING	350000
24	COOKING	MEAT WRAPPING	2900
25	ENGINEERING	BUILDING TECHNOLOGY	441000
26	GLAZING		39364
27	HEALTH	NURSING REFRESHER	24000
28	HEALTH CARE MANAGEMENT		41700
29	SHEET METAL		117440
30	TILESETTING		14320
31	TRAC	SHEET METAL	53000
32	TRAC	ELTT PROJECT	40000
33	TRAC	ELTT BASIC TRADES SKILLS (PART 1)	150000
34	TREE TRIMMING		10490
35	TRAC	WELDING (PART 2)	225000
		TOTAL	1738064

PRIORITY THREE
MAJOR RENOVATIONS TO FACILITIES
PROGRAMS MAY BE MOVED TO OTHER
LOCATIONS BY MOVING EQUIPMENT
CURRENTLY AT BCIT

	PROGRAM	SUB PROGRAM	SAVINGS
36	APPRENTICE	CARPENTRY	148500
37	COOKING	PROFESSIONAL COOKING	190000
38	FORESTRY CREWPERSON		31200
39	PAINTING/DECORATING		55700
40	TRAC	AUTOMOTIVE	164700
41	TRAC	BOILERMAKING	28900
42	TRAC	CARPENTRY	104100
43	TRAC	COMMERCIAL TRANSPORT	43800
44	TRAC	DIESEL MECHANIC	63700
45	TRAC	ELTT BASIC TRADES SKILLS (PART 2)	130000
46	TRAC	HEAVY DUTY	117300
47	TRAC	INDUSTRIAL/INSTRUMENTATION	105900
48	TRAC	MILLWRIGHT	55750
49	TRAC	PLUMBING	143000
		TOTAL	1382550

PRIORITY FOUR
MAJOR RENOVATIONS TO FACILITIES
NEW FACILITIES WILL HAVE TO BE
BUILT AT OTHER LOCATIONS
OR
PROGRAMS TIED TO OTHER ACTIVITIES
AT BCIT

	PROGRAM	SUB PROGRAM	SAVINGS
50	APPRENTICE	JOINERY	78900
51	BOILERMAKING		26500
52	COOKING	PROFESSIONAL COOKING	200000
53	COOKING	RETAIL MEAT	
54	COOKING	PROFESSIONAL RESTAURANT SERVICE	60700
55	COOKING	PROFESSIONAL COOKING APPRENTICE	87800
56	COOKING	BAKING APPRENTICE	74536
57	COOKING	RETAIL BAKING	116400
58	IRON WORKER		15100
59	STEEL FABRICATION		78300
60	TRAC	STEAMFITTING	45000
61	TRAC	MACHINIST	87700
62	TRAC	STEEL FABRICATION	146600
63	TRAC	JOINERY	55350
64	TRAC	ELTT BASIC TRADES SKILLS (PART 3)	100000
65	TRAC	IRON WORKER	42670
66	WELDING	WELDING (PART 3)	200000
		TOTAL	1415556

APPENDIX E

PROPOSAL FOR BRIDGING APPROACH TO ELECTRICAL/ ELECTRONICS TRAINING

APPENDIX E

PROPOSAL RE ELECTRONICS TRAINING AT B.C.I.T.

Note: This material is taken directly from a proposal contained in a submission to the task force, with minor editing. It is presented here for illustrative purposes.

> Unless there are exceptionally strong reasons other than politics for maintaining the distinction between technology and technician electronics training, there should be a realignment of programs that recognizes the commonalty of basic training while permitting different exit levels and providing "bridging" with full credit for courses previously completed.
>
> The chart on the following page shows how electronics training and education can be easily and effectively integrated into a program that delivers fully-qualified job applicants at various leaving levels, that provides effective bridging between them, and simultaneously develops a foundation for degree education.

Notes to the Proposal

1. Regardless of fee paying or sponsorship by any agency, admission to electronics training programs, regardless of the selected leaving level requires the same minimum entry background: completion of such secondary school courses in Algebra, Physics, and Chemistry to a minimum C+ level, or the equivalent by examination, plus demonstrated comprehension of spoken and written English.

2. Certain fundamental courses are common for all students, regardless of their selected leaving levels.

3. Courses should be structured so that students leaving the institute at one of the specified leaving levels may return (within a reasonable time limit) for further studies with full credit for the courses completed.

4. Certificates and diplomas should be issued (a la City and Guilds of London Institute) for at least two levels: Electronics Technician and Electronics Technologist, with correlation to ASTT of BC.

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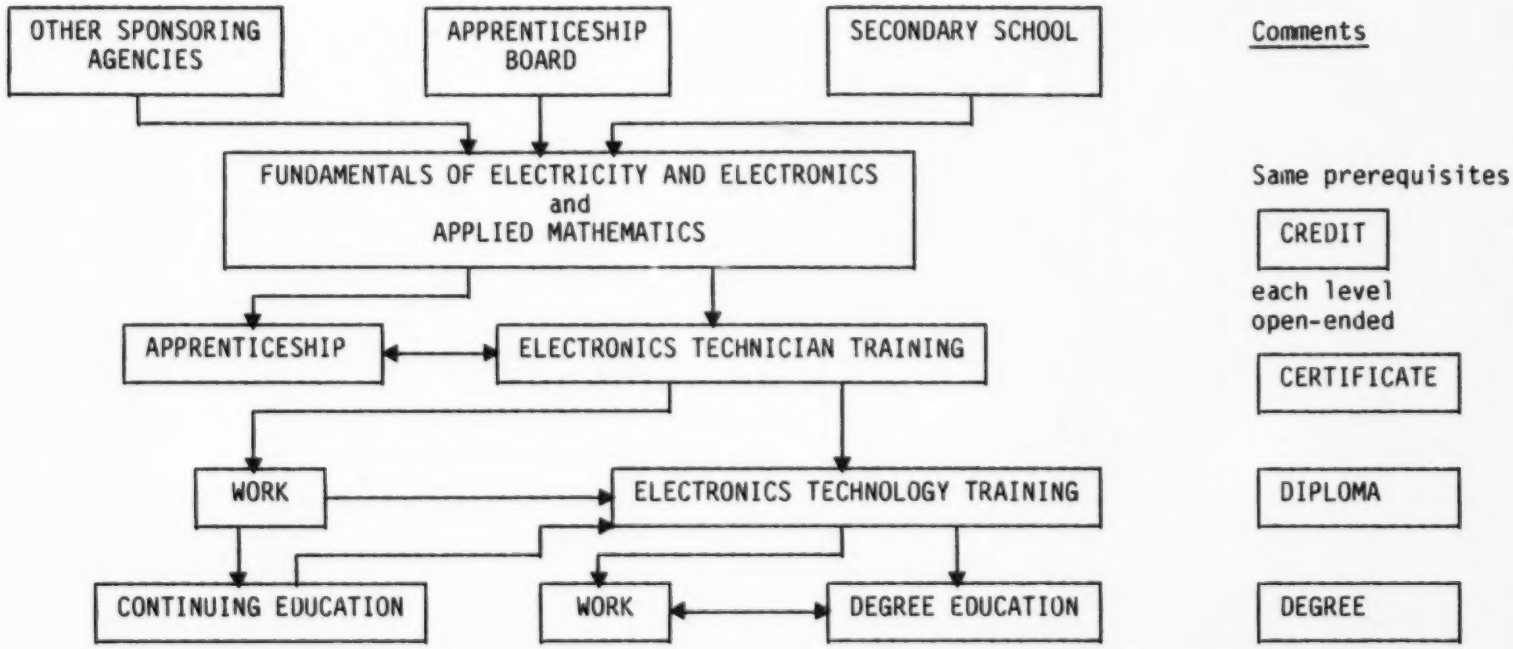
ELECTRONICS TRAINING AT THE NEW BCIT



SOURCE: A SUBMISSION TO THE TASK FORCE

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APPENDIX F

PROGRAM PROFILE
BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY VERSUS
COMMUNITY COLLEGES

SCHEDULE I

PROGRAM PROFILE: BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY VS OTHERS

(Source: Funding & Analysis Branch, Ministry of Advanced Education)
1986 - 1987 Actual Full Time Equivalents

	BCIT	VCC	CAMOSUN	KWANTLEN	MALASPINA	CARIBOO
TOTALS						
Adult Basic (Schedule V)	42	2,267	475	217	421	301
Apprenticeship (Schedule II)	469	7	54	10	20	22
Vocational (Schedule III)	1,743	2,097	780	584	764	724
Career/Technical (Schedule IV)						
Day Program	3,711					
Night School	1,505	-	-	-	-	-
TOTAL	5,216	1,537	1,316	992	506	632
University Transfer (Schedule V)	-	3,058	678	965	1,002	2,369
TOTAL	7,470	8,967	3,304	2,767	2,713	2,369

SCHEDULE II

APPRENTICESHIP PROGRAMS

1. BCIT is the major deliverer of in-school apprenticeship training. Statistics provided by the Provincial Apprenticeship Board indicate that recently B.C.I.T. has accounted for 63 percent of this training in British Columbia.

2. Trends:

   Apprenticeship Training at B.C.I.T. (Full Time Equivalents)

84/85	85/86	86/87
545.9	418.9	468.8

3. There are 31 separate apprenticeship training programs at B.C.I.T.:

		FTE*
The 5 largest:	Electrician	100
	Plumber/Steamfitting	43
	Auto Mechanic	40
	Carpentry/ Building Apprentice	32
	Cooking	28
	Others	226
	TOTAL	469

* Full time equivalents

SCHEDULE III

VOCATIONAL PROGRAMS

(Full Time Equivalents)

	BCIT	VCC	CAMOSUN	KWANTLEN	MALASPINA	CARIBOO
2000 TRAC	775	29	105	141	89	91
2411 Welding	118	-	27	57	53	37
2371 Aircraft Maintenance	110	-	-	-	-	-
2121 Drafting	62	75	-	77	11	8
2221 Elecronics	67	77	-	-	-	48
3442/5 Cooking/ Baking/Meat	232	243	45	-	89	55
9800 Part Time	144	153	144	48	92	141
3210 Office Administration	-	284	173	161	119	209
4260 LTCA	-	38	67	19	40	22
4250 Practical Nursing	-	113	-	-	-	-
Other						
TOTAL	1,743	2,097	780	584	764	724

SCHEDULE IV

CAREER/TECHNICAL PROGRAMS

BUSINESS

	BCIT TOTAL	BCIT	VCC	CAMOSUN	KWANTLEN	MALASPINA	CARIBOO
Administrative Management	597	389ns 208					
Operational Management	237	80ns 157					
Marketing Management	550	219ns 331	47				
Financial Management	640	247ns 393	120				
Broadcast	240	52ns 188ns					
Hospital & Tourism	332	54ns 278		48		53	
Business Administration	332	___	216	417	360	157	166
TOTAL	2,596		383	465	360	210	166

1. Colleges' "Business Administration" usually contains elements of B.C.I.T. core courses.

2. V.C.C. descriptions may not be equivalent to B.C.I.T. programs.

SCHEDULE IV

CAREER/TECHNICAL PROGRAMS

HEALTH

	BCIT	VCC	CAMOSUN	KWANTLEN	MALASPINA	CARIBOO
Nursing	160	157	258			167
Medical Radiology	78					
Biomedical Electronics	67					
Medical Laboratory 2	57					21
Environmental Health	45					
Other	125					
Certificate	82					
Respiratory Technician						74
RN Diploma					27	
Dental Technician/Mechanic		56				
TOTAL	614	213	258		27	262

1. B.C.I.T.'s many small programs are generally unique; the Institute offers 19 full time programs.

SCHEDULE IV

CAREER/TECHNICAL PROGRAMS

ENGINEERING TECHNOLOGY

	BCIT	VCC	CAMOSUM	KWANTLEN	MALASPINA	CARIBOO
1111 Bio Science	6[ns] 64		56 (biochem lab)			
1210 Forestry	14[ns] 139				36	
1313 Chemical Science	14[ns] 82					
2111 Civil/Structural Management	21[ns] 123		21	7		
2112 Surveying	7[ns] 99					46 (drafting)
2210 Electonics	43 353		81	94	13	
2311 Mechanical/ Mechanical Systems	23[ns] 120		54	8		
2510 Building Technology	27 105					
3510 Computer Systems	194 212		93	96	16	31
Other - Full Time	302					
Certificates[ns]	25					
Process Technology				29		
TOTAL	1,973		305	234	65	77

[ns] = Night School.
Night school enrollment is included in statistics for other institutions.

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APPENDIX G

BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY COSTS:

POSSIBLE AREAS OF SAVINGS

BCIT COSTS: POSSIBLE AREAS OF SAVINGS

One way of attempting to fund new BCIT initiatives is to make savings in support areas, and in existing program areas.

The following represent opportunities for savings.

		Approximate annual savings
		$000
1.	Eliminate the deficit in the food services area, e.g., by contracting out	100-200
2.	Reconfigure computer system, so that:	
	(a) administration is carried on more modest equipment, using packaged software wherever possible; and,	
	(b) the size of the academic computing hardware is reduced once the demands of administration are eliminated	800-1,000
3.	Build classroom facilities for the business school, which allow for larger classes for group work (capital cost involved)	800
4.	Reduce eltt basic trades skills, administration and training	300
5.	Reduce costs in the academic support areas by:	
	(a) reducing the number of specialized, program-specific sources and therefore increasing class sizes; and,	
	(b) changing staff mix	500
6.	Develop a new student records system, thus making registrar functions more streamlined (development cost involved)	200
7.	Eliminate the VP Administration position, and reduction in secretarial and other support positions at the executive level	180
8.	Decentralize, and ultimately remove, the program advisory function	300

	Approximate annual savings
	$000
9. Decentralize various functions to associate deans: while in the short run the costs would simply be transferred, the long run benefit should be lower administrative needs: e.g., purchasing/stores/inventory - co-op education	Unquantifiable
	$3,180-$3,480

Many of these suggestions involve sacrifices, but they represent opportunities for choices on behalf of BCIT.

October 14, 1987
RGE/lmt

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